



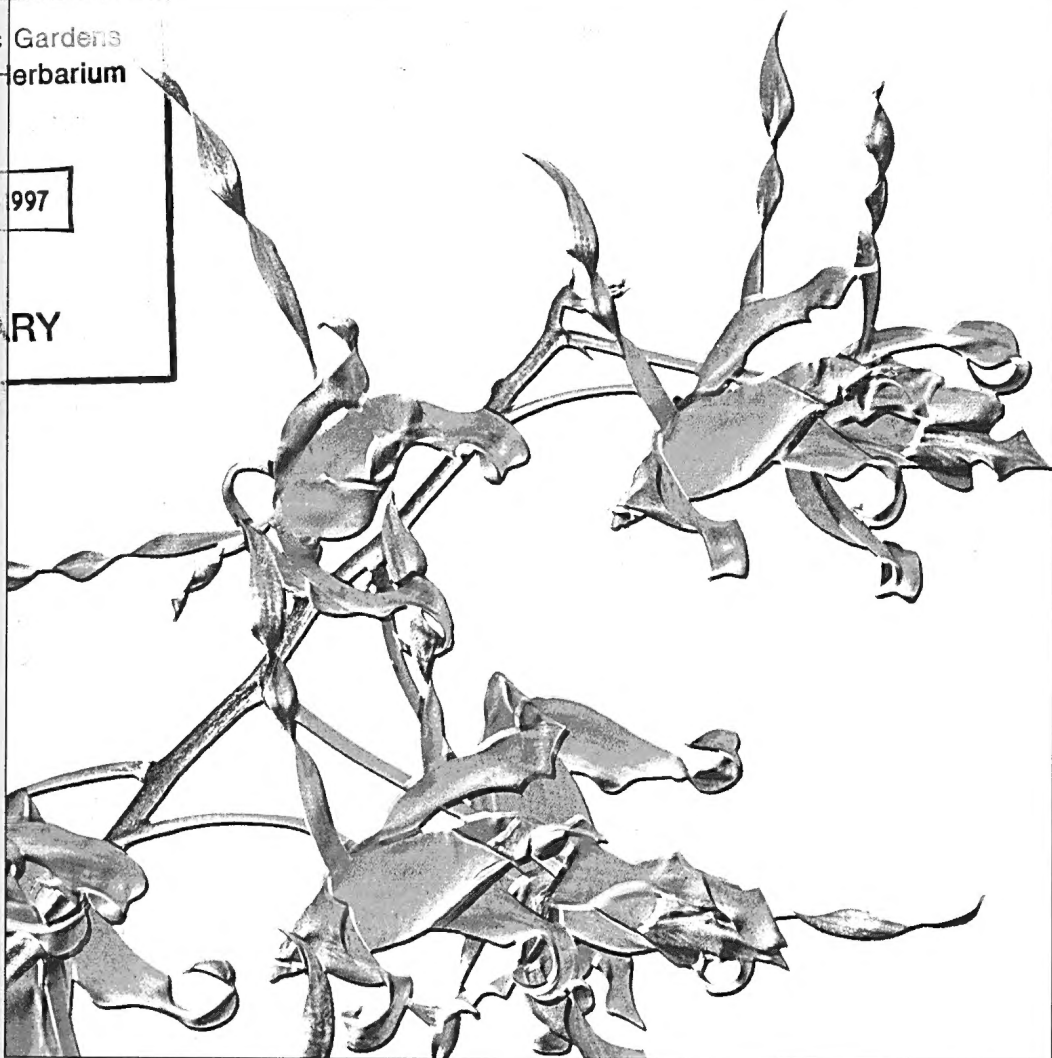
LASIAN.THERA

The Scientific journal for the
Orchidaceae of Papua New Guinea

Royal Botanic Gardens
and National Herbarium

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June-December

1996



NATIONAL CAPITAL BOTANICAL GARDENS PAPUA NEW GUINEA



OFFICE OF THE GOVERNOR

Hon. Bill Skate
MEMBER FOR NCD
CITY OF PORT MORESBY

GOVERNOR'S MESSAGE

It is a source of considerable pride and with a great sense of gratitude to the people responsible that I am able to at long last write this message for the inaugural issue of LASIANTHERA, the Scientific Orchid Journal of Papua New Guinea.

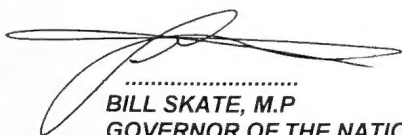
Orchids are in my view the epitome of the magnificent vegetation which covers this green and diverse land of ours and as such it is fitting that at last we have a medium to make information on orchids and our botanical and conservation work available to the world at large and that very important body, orchid lovers all around the world.

This publication is initially scheduled to be an annual, but it is my fervent wish that with an increase in our conservation work, our identification of new species and sub species and the development of new and interesting hybrids that we will soon be able to achieve a quarterly publication status.

Like the accreditation of our Port Moresby Botanical Gardens as the National Centre for Orchid Research and the control of exports from Papua New Guinea this publication is a tribute to the dedication of our young Curator - Mr Justin Tkatchenko and the very able team he has built up to assist him. Special thanks must also go to the Australian National Botanical Gardens and to Drs. Mark Clements and David Jones in particular.

It is my view that too often my country has failed in its short history to achieve its potential, not because of lack of ability or lack of resources, but because of a lack of passion on the part of the people involved. It is the passion of the Botanical Gardens staff, the passion for our epiphytic beauties which has spurred them on and I believe they will continue to discover new species and sub-species which will delight serious collectors everywhere. With this publication these jewels will not simply be hidden treasure but placed on display where they belong for all the world to admire.

I look forward to reading many issues of Lasianthera and trust that you will too.



.....
BILL SKATE, M.P.

GOVERNOR OF THE NATIONAL CAPITAL DISTRICT

NATIONAL CAPITAL DISTRICT COMMISSION
City Hall, Waigani Drive, Waigani

P.O. Box 7270, Boroko, NCD, Papua New Guinea Phone: 325 5655, 324 0702 Fax: 325 0591

INDEPENDENT STATE OF PAPUA NEW GUINEA

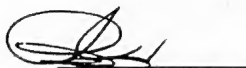
INTERNATIONAL TRADE (FAUNA AND FLORA) ACT FAUNA (PROTECTION AND CONTROL) ACT

APPOINTMENT OF SCIENTIFIC AUTHORITY

I, IAMO ILA, Secretary and Conservator of Fauna, by virtue of the powers conferred by the International Trade (Fauna and Flora) Act and all other powers me enabling, hereby declare that, as a party to the Convention on International Trade in Endangered Species of Fauna and Flora (CITES) and being the Management Authority for the CITES in Papua New Guinea, it is agreed on principle for the recognition of the National Capital Botanical Gardens as a Scientific Authority on Orchids. It is therefore for this purpose that the above Institution is now endorsed and accorded the Status of the Scientific Authority on Orchids with the following agreement and conditions.

- 1). That the Department of Environment and Conservation agree and implement that the National Capital Botanical Garden will be the official undertaker of the identification and classification of the orchidaceae family in Papua New Guinea.
- 2). The official work will be done through scientific research and co-operation with overseas and National Institutions and their scientists for the benefit of Papua New Guinea.
- 3). The Botanical Garden will supply all aspects of information for the Department of Environment and Conservation on the orchidaceae family when needed for their information, research or correspondence.
- 4). With taking on these National and International responsibilities, appropriate facilities will be set up to carry out the objectives of the institution incorporating the Department of Environment and Conservation staff to help assist and be taught on the research of orchids in Papua New Guinea.
- 5). All research and information that is to be carried on the orchidaceae family in Papua New Guinea by National and Foreigner Institutions or persons, must go through the correct Institution and procedures eg. Botanical Gardens, so duplication of research and publications does not occur for the protection of our national asset.
- 6). That the National Capital Botanical Gardens work harmoniously together with the Department of Environment and Conservation to ensure that the Scientific Institution be totally successful for the benefit of both parties concerned.
- 7). The National Capital Botanical Gardens will not undertake commercial export of orchids.
- 8). The National Capital Botanical Gardens will need to follow procedures regarding exporting of orchids for educational, research, or exhibits by way of endorsement through the Department of Environment and Conservation by obtaining export CITES documentation.

Dated this 26th day of JUNE 1996



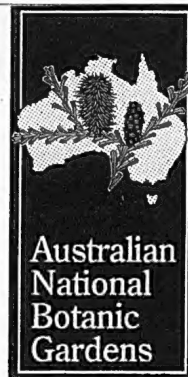
IAMO ILA

Secretary and Conservator of Fauna



AUSTRALIAN NATIONAL
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To the people of Papua New Guinea

Papua New Guinea is part of one of the most biologically diverse regions on earth. It is home for a vast array of natural biological treasures not least of which are the unbelievably beautiful Birds of Paradise, symbolised on the country's national flag. Another great treasure is its orchids. The New Guinea region boasts possibly the richest orchid flora in the world, with many exquisitely beautiful, sometimes bizarre, and even delightful species being already known to science. One of the most recognisable and famous species is *Dendrobium lasianthera*, or as it is known locally the 'Sepik River Blue'. It is the origin of the name for the new scientific publication for the orchids of Papua New Guinea.

The publication of the first issue of *Lasianthera*, the new scientific journal for the Orchidaceae of Papua New Guinea is of great significance. It represents the first official scientific publication, excluding the works of Schlechter (1911-14), dealing exclusively with the orchids of Papua New Guinea. It aims simply to provide a national medium through which the orchids of Papua New Guinea can be enunciated and classified, and through this means promote, and aid in the conservation of this wonderfully rich orchid flora.

It is a privilege to have two of my staff as the two principal authors of papers presented in the inaugural issue of *Lasianthera*. It is to be hoped that other scientists working on orchids in the region will submit the results of their research for publication in this new journal, to directly benefit the people of Papua New Guinea. *Lasianthera* is aiming to be the premier New Guinea publication for publishing scientific work on orchids.

The setting up of *Lasianthera* is concurrent with the development and raised profile of the National Capital Botanical Gardens as both institute and scientific authority dealing with orchids in Papua New Guinea, where orchids are being studied and on display. This is the first for Papua New Guinea with Mr Justin Tkatchenko and the Hon. Bill Skate, Governor of Port Moresby being the major instigators. They are to be commended for their foresight and endeavours in this enterprise.

I congratulate the people of Papua New Guinea for the initiative of producing *Lasianthera* and trust that it will be significant in the successful conservation of their orchid treasure.

Dr Helen Hewson
Ag Director, ANBG



A division of the Australian National Parks and Wildlife Service





NATIONAL CAPITAL BOTANICAL GARDENS

MESSAGE FROM THE **SUPERINTENDENT - PARKS & GARDENS**

It gives me great pleasure and pride with gratitude, to issue to the Orchid Growers of the world the inaugural issue of Lasianthera the Scientific Orchid Journal of Papua New Guinea.

It has been my endeavour to produce a Scientific Botanical Journal on the Orchids of Papua New Guinea through our Botanical Gardens to give our unique and newly discovered orchids species the recognition that they deserve.

The important aspect of this journal is to promote the preservation and conservation of our orchids species and to protect them for our future generations.

This is the first Scientific Botanical Journal of its kind to come out of Papua New Guinea on orchids, and I am proud to say that this nationally orientated journal will continue to develop for a better understanding for our unique orchid species.

This journal would have not been possible without the professional dedication and hard work of Dr. Mark Clements and Dr. David Jones of the Australian National Botanical Gardens in Canberra, who both described these orchid species with their love and passion for Papua New Guinea.

I feel that this journal will set a new standard for Papua New Guinea in overwhelming the orchid fraternity in our rich orchid treasures we hold in the realms of our country, which will create a new attraction to our Botanical Gardens.

.....
JUSTIN W. TKATCHENKO
CURATOR - NCBG
SUPERINTENDENT - PARKS & GARDENS



PAPHIOPEDILUM STRIATUM (ORCHIDACEAE), A NEW SPECIES FROM PAPUA NEW GUINEA

Mark A. Clements & David L. Jones

Centre for Plant Biodiversity Research, Australian National Herbarium, G.P.O. Box 1600, Canberra, A.C.T., AUSTRALIA, 2601

ABSTRACT

: *Paphiopedilum striatum* (Orchidaceae: Cypripedioideae), collected in the Southern Highlands of Papua New Guinea and erroneously treated as *P. wilhelminae*, is described as a new species.

The genus *Paphiopedilum* Pfitzer is represented in New Guinea by two taxonomic sections, viz *Coryopedilum* Pfitzer and *Barbata* Kraenzl. (Cribb 1987). The exact number of species present in both groups has been the subject of much discussion (for example Asher 1980, 1986, Braem 1988, Fowlie 1991, Reisinger 1993, 1994a).

Garay (1995), in a recent comprehensive review of the *P. praestans* (Rchb.f.) Stein complex, based on an objective analysis of the relevant types and original protologues, recognised four species; *P. praestans* (including two or three varieties), *P. glanduliferum* (Blume) Stein., *P. gardineri* Guillemard and *P. wilhelminae* L.O. Williams. We agree with his assessment of the complex, disagreeing only on the interpretation of the plant illustrated by Cribb (1987) under the name *P. glanduliferum* var. *wilhelminae* which is here described as a new species.

In 1978 Tom Reeve discovered a population of a *Paphiopedilum* in the Southern Highlands Province of Papua New Guinea, identifying them as *P. wilhelminae*. The following year, the Australian National Botanic Gardens received six living plants from this collection as part of a consignment of New Guinea orchids. We understood the plants to represent six clones of the species.

Large numbers of seedlings have successfully been propagated in vitro by Roger Kramer from seeds originating from a cross between two of these clones. These seedlings have since flowered and the major diagnostic features, apparent in the parents, are also present in the seedlings, confirming the stability of these characters for diagnostic purposes. We conclude that the Reeve collection represents a different taxon from *P. wilhelminae* and is an undescribed species. It is here described for the proposed treatment of Papua New Guinea Orchidaceae as part of a cooperative program between the National Capital Botanical Gardens, Port Moresby, Papua New Guinea and the Australian National Botanic Gardens/ Centre for Plant Biodiversity Research, Canberra, Australia.

MATERIALS AND METHODS

The description of the new species was made from a range of sources including fresh living plants, dried herbarium specimens, spirit preserved specimens stored in BANG mix (65 % ethanol, 5 % glycerol and 30% water), floral dissection cards and 35 mm colour transparencies of flowers and plants. Specimens were examined from the following herbaria: BRI, CANB, CBG, K, L, MEL and W. Herbarium abbreviations follow

Holmgren et al. (1990). Unless otherwise indicated, all types (or photographs thereof) and collections cited have been seen.

Paphiopedilum striatum

M.A. Clem. et D.L. Jones, *spec. nov.*

affinis *P. wilhelminae* L.O. Williams et *P. gardineri* (Guillemard) Pfitzer sed floribus 1-3, distanter dispositis; sepalis prominente striatis; petalis semel torsivis, processis glandulosis in marginibus basalibus carentibus; sepalo dorsali obovato; synsepalo ovato-lanceolato emarginato; et staminodio quadrato, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 17 Sept. 1985, J.M. Taylor 2498 (Holotype CANB). PROVENANCE: plant originally collected in Southern Highlands [precise locality withheld for conservation purposes], Papua New Guinea, July 1978, T.M. Reeve 78.

[*Paphiopedilum wilhelminae* auct., non L.O. Williams; Reeve, *Orchadian* 6(7): 152, f. (1980)]

[*Paphiopedilum glanduliferum* (Blume) Stein var. *wilhelminae* auct., non (L.O. Williams) P.J. Cribb; P.J. Cribb, *The Genus Paphiopedilum*. 111, f. (1987); Cruttwell, *Orchadian* 9(11): 245 (1990)]

Terrestrial or lithophytic **herb** to 40 cm tall. **Rhizome** short, covered by leaf bases. **Roots** fleshy, brown; c. 3-4 mm wide, covered in root hairs, arising from the base of "growths". **Leaves** 4-6 on each "growth", oblong-linear, when mature 25-36 cm x 18-25 mm, coriaceous, porrect to erect, alternate, conduplicate, glabrous, light green, persistent and with a minutely bifid apex; lowermost leaves reduced and bract-like. **Inflorescence** 1-3-flowered, two to three times longer than the leaves, arising from

the centre of a mature "growth", subtended by an ensheathing oblong-linear bract; bract with a slightly recurved apex, to 10 cm x 10 mm. **Peduncle** terete, 18-32 cm long, minutely pubescent throughout, erect to semi-pendulous, reddish-brown. **Floral bracts** lanceolate, 28-40 mm x 12-20 mm, conduplicate, persistent, minutely hirsute along the basal margin. **Pedicels** glabrous, 8-15 mm x c. 2 mm, dark reddish-brown, obscurely differentiated from the ovary. **Ovary** fusiform, 35-40 mm x c. 4 mm, glabrous, dark reddish-brown. **Flowers** erect, 9-10 cm x 10-12 cm; sepals white with reddish-maroon longitudinal striations, petals light greenish-brown with darker striations, the mid-vein prominent; labellum dull yellow, prominently streaked with light red towards the base; staminode disc prominent, large, yellow with brownish hairs on its margin. **Dorsal sepal** erect, ovate, 43-46 mm x 24-26 mm, cucullate, rostrate, glabrous except for a few cilia on the apical margins, with a median dorsal keel, and campylodromous veining with 12-13 distinct broad longitudinal nerves. **Petals** linear-lanceolate, 50-85 mm x 7-8 mm, spreading widely, with one complete twist, basal margins crispate-undulate, with multicellular dark cilia to 2 mm long, the central third on the anterior side glabrous, dorsally covered with short brown, glandular cilia, extending to the margins, thickest nearest the acuminate apex. **Labellum** deeply urceolate, 48-50 mm long and c. 18 mm in diameter at the mouth of the pouch; claw c. 25-30 mm long, oblong to quadrate when expanded, the margins involute, touching or slightly overlapping at the apex, the inner horn-like processes 3 mm long, glabrous on the dorsal side, with multicellular cilia on the proximal half on the ventral side; pouch 20-25 mm long,



rounded, truncate. **Column** c. 18 mm long; staminode prominent, quadrate, 15-18 mm x c. 15 mm, free almost to the base, the dorsal central area naked, shiny, yellow, reddish towards the middle, concave towards the apex, truncate, the rim verrucose except for the apex, dorsally with two small, blunt, auriculate calluses, and margins with thick multicellular red hairs, sparser towards the base. **Stigma** suborbicular, convex, shiny. **Anthers** two, one either side of the column, on short filaments. **Pollinia** oblong-reniform, orange, soft, waxy, sticky. **Capsule** fusiform, elongate. **Fig. 1 & Plate 1A, B & C.** **FLOWERING PERIOD:** Collected in flower in July, flowering July to September in cultivation, perhaps also sporadically at other times.

ILLUSTRATIONS: page 111, Cribb (1987) (as *Paphiopedilum glanduliferum* var. *wilhelminae*); page 245, top plate, Cruttwell (1990) (as *Paphiopedilum glanduliferum* var. *wilhelminae*).

DISTRIBUTION: Apparently restricted to a small area in the Southern Highlands of Papua New Guinea.

HABITAT: Terrestrial or lithophytic growing on limestone rubble and forming big clumps. Most plants apparently grow in exposed situations in full sunlight. Altitude: c. 1200-1800 m.

RECOGNITION: *Paphiopedilum striatum* is characterised by the following combination of features; one to three widely spaced flowers; prominently striped sepals; petals twisted in one complete revolution, lacking glandular processes along the basal margins; dorsal sepal obovate; synsepal ovate-lanceolate, emarginate; and staminode quadrate.

AFFINITIES: *Paphiopedilum striatum* belongs to the *P. praestans* complex (**Plate 1A & 1E**), differing from that species in having smaller flowers with a blunter labellum, petals

lacking glandular processes along the basal margins, an obovate rather than lanceolate dorsal sepal, and a quadrate rather than linear-oblong staminode. From *P. wilhelminae* it differs in having up to three widely spaced flowers, twisted petals, ovate-lanceolate synsepal with a minutely emarginate, papillate apex, more prominently striped segments and a quadrate rather than linear-oblong staminode. Perhaps the closest species is *P. gardineri* (Garay 1995) (**Plate 1D**), which is a smaller growing species that has mostly one or two (rarely three) smaller flowers in cultivation with shorter, narrower, petals with a few glands along the margins, a broader labellum pouch and a red trapezoid staminode.

NOTES: Cribb (1987) has argued that the differences between taxa in this group merely represent variation within the species *P. glanduliferum*. Garay (1995), published an alternate view in which he clearly defined each taxon in the complex and provided a key based primarily on the shape of the staminode, which is a critical diagnostic feature for the genus. These features are readily recognisable in cultivated plants and have proved to be very stable in hundreds of siblings of each taxon (R. Kramer pers. comm.).

The new species is isolated from any known population of other species in the complex and is therefore unlikely to be able to interbreed with them. As pointed out by Garay (1995), both *P. glanduliferum* and *P. wilhelminae* are unknown in cultivation and so direct comparison of living material is impossible.

Until a thorough analysis of the group can be carried out, using molecular or isoenzyme techniques, it is not possible to elucidate the phylogeny of these taxa. We

believe it is imperative that each distinctive population should be recorded before it is lost to science, through poaching, destruction of habitat or other events.

CONSERVATION STATUS: On the basis of collection data it would appear the new species is of restricted distribution and not very common.

ETYMOLOGY: From the Latin 'striatus' meaning striped, in reference to the conspicuously striped flowers.

SPECIMENS EXAMINED: PAPUA NEW GUINEA: Southern Highlands Province; July 1980, T.M. Reeve 455 (CANB! E, K! L! LAE); Sept. 1981, T.M. Reeve 4276, (CANB! K, LAE, NSW).

ACKNOWLEDGMENTS

The authors wish to express their sincere thanks to Roger Kramer, Wilton Paphiopedilum Research Collection, New South Wales, and Justin Tkachenko, Curator of the National Capital Botanical Gardens, Port Moresby, for their generous help and assistance; Marion Garratt, Maggie Nightingale and Karina Fitzgerald for technical assistance, Melissa Ogden for preparation of the illustration and Alex George for the Latin translation.

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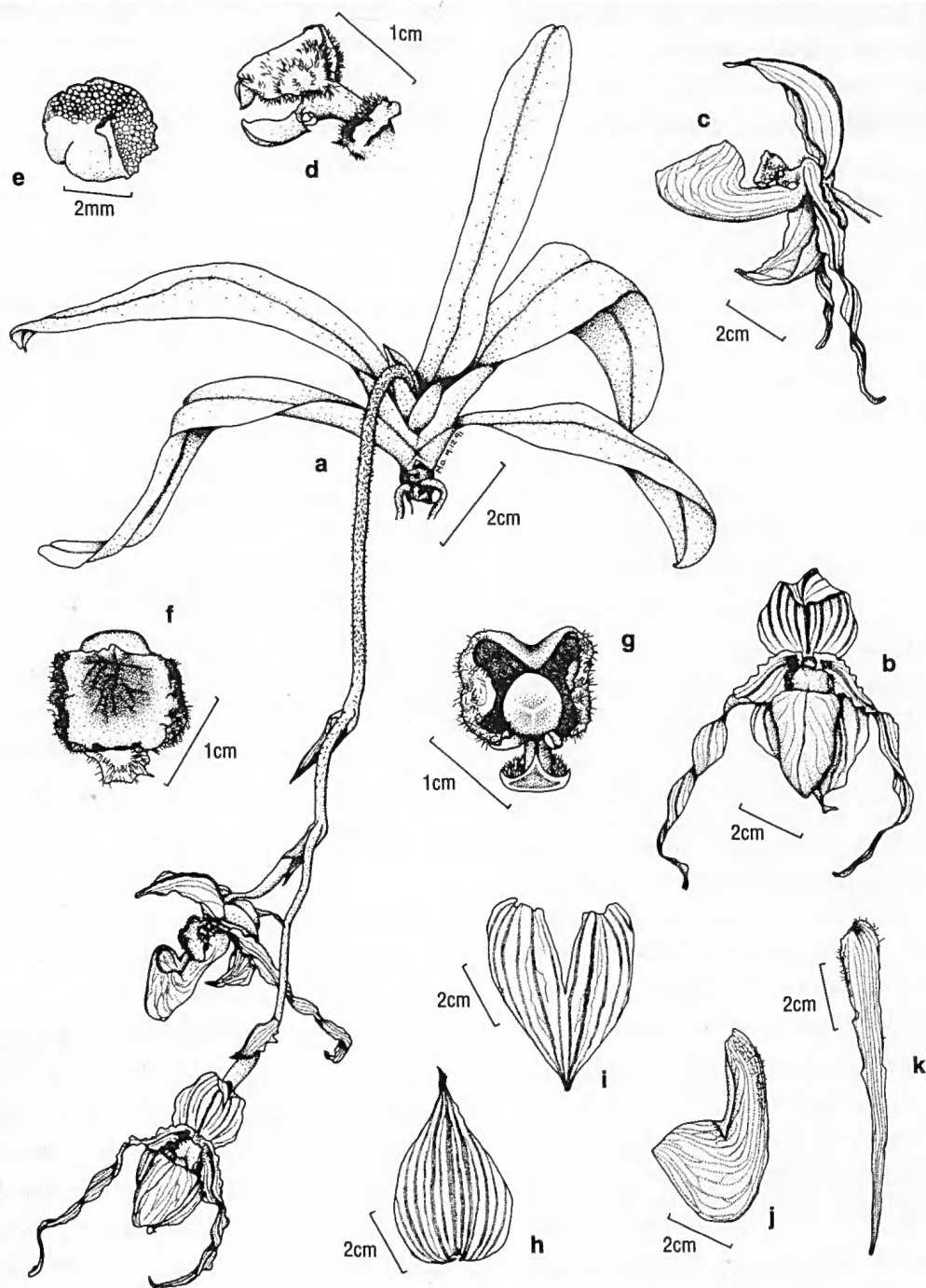


Figure 1. *Paphiopedilum striatum*, Southern Highlands Province, Papua New Guinea, Reeve 78: **a.** plant: **b.** flower from front: **c.** flower from side: **d.** column from side: **e.** anther: **f.** column from front: **g.** column from rear: **h.** dorsal sepal: **i.** synsepal: **j.** median section through the labellum: **k.** petal.



Plate 1A. Comparison between plants of *Paphiopedilum gardineri* (left), *P. praestans* (centre) and *P. striatum* (top and right) in cultivation.



Plate 1D. *Paphiopedilum gardineri*.

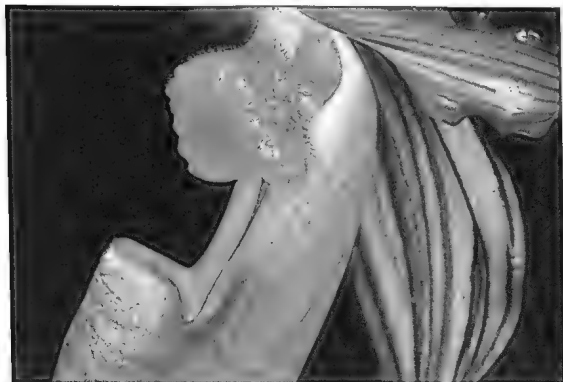


Plate 1B. Staminode of *P. striatum* from the side.



Plate 1E. *Paphiopedilum praestans*.



Plate 1C. Staminode of *P. striatum* from the front.

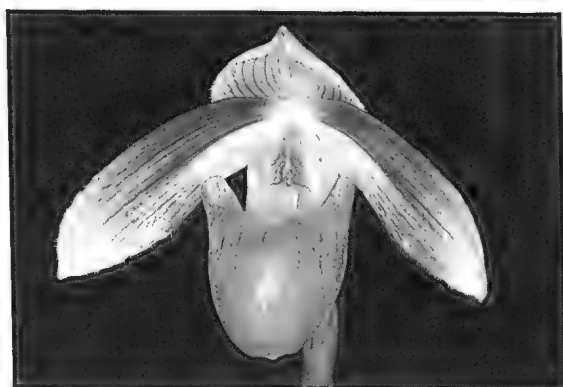


Plate 1F. *Paphiopedilum violaceum*..



NEW SPECIES OF DENDROBIINAE (ORCHIDACEAE) FROM PAPUA NEW GUINEA

Mark A. Clements & David L. Jones

Centre for Plant Biodiversity Research/Australian National Herbarium, G.P.O. Box 1600, Canberra, A.C.T., AUSTRALIA, 2601

ABSTRACT:

Seven species of Dendrobiinae (Orchidaceae) from Papua New Guinea, *Dendrobium vesiculosum*, *Dockrillia caudiculata*, *Dockrillia convoluta*, *Dockrillia delicata*, *Dockrillia fuliginosa*, *Dockrillia hepatica*, and *Dockrillia nothofaeti* are described as new. Seven new combinations in *Dockrillia* and one in *Grastidium* are made; *D. bowmanii*, *D. brevicauda*, *D. calamiforme*, *D. casuarinae*, *D. dolichophylla*, *D. nugentii*, *D. schoenina* and *Grastidium tozerensis*.

This is the first in a series of papers describing new species from Papua New Guinea, mostly discovered during the Schlechter-Lauterbach Commemorative Expedition organised by the Christensen Research Institute in 1989-90. This expedition was undertaken principally to recollect Orchidaceae in areas visited by Rudolf Schlechter and Karl Lauterbach between 1890 and 1908 (Clements and Ziesing 1990). Collections from these areas were the main source of material for orchids described by Schlechter in his thesis on "The Orchidaceae of German New Guinea" (Schlechter, 1911-14). The main purpose of the 1989-90 expedition was to recollect material to replace types destroyed in Berlin during the Second World War. The results of this aspect of the expedition will be the subject of another paper (Clements, in prep.). During the course of the 1989-90 expedition a number of species not accounted for by Schlechter and other workers were discovered.

Schlechter's treatment of the Dendrobiinae was revised by Brieger

(1981), who described many new genera. Whilst there has been general rejection of Brieger's work in subsequent treatments of sections of *Dendrobium* sens. lat. (Cribb 1983, Cribb 1986, Reeve and Woods 1989), the fact remains that many of the genera proposed are monophyletic, are readily defined and easily recognised. Our studies on mycorrhizal fungal associations, reproductive biology, embryology, protocorm morphology, pollination, floral morphology and vegetative habit, support the narrower interpretation of this group of orchids. This view is supported by cladistic analyses (Clements and Jones, in prep.).

In this current paper we describe seven new species of Dendrobiinae, six in *Dockrillia* Brieger and the other in *Dendrobium* sens. str., and make seven new combinations in *Dockrillia* and another in *Grastidium* Blume.

MATERIALS AND METHODS

The description of these new species was made from a range of sources including fresh living plants, dried herbarium specimens, spirit preserved specimens stored in BANG mix (65 % ethanol, 5 % glycerol and 30%

water), floral dissection cards and 35 mm colour transparencies of flowers and plants. Specimens were examined from the following herbaria: B, BM, BRI, CANB, CBG, K, L, MEL, NSW, P, QRS, W and Z. Herbarium abbreviations follow Holmgren et al. (1990). Unless otherwise indicated, all types (or photographs thereof) and collections cited have been seen.

NEW SPECIES

Dendrobium vesiculosum M.A. Clem. et D.L. Jones, spec. nov.

affinis *D. leucorhodo* Schltr. a qua floribus nodo geminatis, floribus minoribus flavovirescentibus; margine petalorum et labelli non serrulato; labello linearilanceolato acuminato, et callo perreducto vesiculis minutis albis differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 2 Jul. 1990, M.A. Clements (Holotype CANB; Isotype CANB, NCBG¹). PROVENANCE: plant originally collected on the ridge above Korepo village in Waria River Valley, Morobe Province, Papua New Guinea, 500 m., 9 Apr. 1990, M.A. Clements 6631, P. Ziesing, D. Benzing, E. Dauncey, A. Kairo and O. Simeon.

Plant epiphytic with pendulous stems. **Rhizome** much abbreviated. **Pseudobulbs** 25–35 cm x 0.8–1.2 cm, more or less cylindrical, when young covered with hyaline sheaths. **Leaves** c. 8 per pseudobulb, linear-elliptical to linear-lanceolate 8–10 cm x 1.8–2.2 cm, bright green, thin-textured; base cuneate; apex acuminate and slightly recurved. **Inflorescence** lateral, bearing 2 flowers. **Peduncles** 0.7–1 cm long, sheathed with papery, hyaline bracts. **Pedicels** about 1 cm long, slender, green. **Ovary** c. 3 mm long. **Flowers** c. 2 cm across, pale greenish yellow, expanding widely, lacking any

noticeable scent. **Dorsal sepal** linear-ovate, 14–15 mm x 4.5–5 mm, erect and shallowly recurved; apex subacute. **Lateral sepals** linear-oblong, 14–15 mm x 4.5–5 mm, slightly falcate, connate at the base, widely divergent; apex subacute. **Petals** lanceolate 12–14 mm x 4–4.5 mm, widely divergent; apex subacute. **Labellum** linear-lanceolate 12–13 mm x 4.5–5 mm, thin textured, erect in proximal third then porrect; apex acute to acuminate, decurved. **Callus** linear-lanceolate, slightly thickened, yellowish green, with minute whitish vesicles in the distal half. **Column** c. 4 mm long, porrect from the end of the ovary; column foot c. 5 mm long, slightly curved. **Anther** c. 2 mm x 1.5 mm, erect, pale yellow with small projections. **Pollinia** 4, c. 1 mm long, linear-clavoid, orange, waxy. **Stigma** c. 1.2 mm long, elliptical, sunken. **Capsule** not seen.

Fig. 2 & Plate 3 & 4A.

FLOWERING PERIOD: Cultivated plants flower sporadically throughout the year. The flowers last 5–10 days and are not self pollinating.

DISTRIBUTION: Papua New Guinea, where presently known only from the Waria River Valley in the Morobe Province.

HABITAT: On trees in disturbed rainforest growing on low ridges in the valley floor.

RECOGNITION: *Dendrobium vesiculosum* is characterised by the following combination of features; pendulous pseudobulbs; two-flowered inflorescences; flowers pale greenish yellow, about 2 cm across; petals and labellum margins entire; linear-lanceolate, thin-textured labellum; and labellum callus beset with minute, whitish vesicles.

AFFINITIES: *Dendrobium vesiculosum* has some affinities with *D. leucorhodum* Schltr. but its

reduced racemes have paired flowers (1-3 in *D. leucorhodium*) which are smaller, wholly pale greenish yellow and the margins of the petals and labellum lack the minute serrulations which are characteristic of *D. leucorhodium*. The labellum of the new species is linear-lanceolate with an acute to acuminate apex whereas that of *D. leucorhodium* is orbicular with an apiculate apex.

NOTES: At first glance the labellum of this species appears to be petaloid; rather it is simple, thin-textured and with a superficial callus, the most prominent feature of which is the tiny whitish vesicles.

CONSERVATION STATUS: Only a single plant was seen but the species is probably more widespread.

ETYMOLOGY: From the latin 'vesiculosus', covered with little bladders or blisters.

Dockrillia caudiculata M.A.Clem. et D.L. Jones, spec. nov.

affinis *Dendrobio flagellae* (Schltr.) Rauschert sed floribus comparate parvis (20-25 mm latis), late aperiens, cremeo-flavis, labello rufo-maculato et purpureo-suffuso; petalis late effusis, lineari-obovatis (12-14 mm x c. 0.8 mm), saepe ad apicem acutum flexis vel geniculatis; labelli lobis lateralibus quam lobo medio multo longioribus, lobo medio cauda prominente acuminata, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 22 Feb. 1993, M.A. Clements (Holotype CANB; Isotype NCBG). PROVENANCE: plant originally collected at Sattleburgh near Finschhafen, Morobe Province, Papua New Guinea, 1989, N.H.S. Howcroft (M.A. Clements 7284).

[*Dendrobium* aff. *teretifolium* auct., non R. Br.; O'Byrne, Lowland Orchids Papua New Guinea 318-19, f., t. (1995)]

Pendulous epiphytic **herb** forming sparse clumps 1.5-2 m long. **Aerial roots** absent or rare. **Stems** straight, 2-15 cm x 2-3 mm, becoming yellow-brown on senescence. **Leaves** linear-terete, 10-50 cm x 3-5 mm, pendulous, dark green to grey-green. **Racemes** 10-15 cm long, wiry, arising singly from nodes at the leaf base, bearing 10-20 flowers. Pedicels 8-10 mm long, filiform. **Ovary** 1-2 mm long, hardly developed at anthesis. **Flowers** about 2.5 cm across, opening widely, creamy-yellow with red spots near the centre; labellum greenish-yellow with purplish suffusions and markings. **Dorsal sepal** narrowly oblong-elliptical, 10-14 mm x 2-2.5 mm, erect, apex acuminate. **Lateral sepals** asymmetrically oblong-lanceolate 10-14 mm x 2-2.5 mm, strongly falcate, widely divergent, apex acuminate. **Petals** narrowly linear-obovate 12-14 mm x c. 0.8 mm, widely spreading, often bent near the acute apex. **Labellum** curved in the proximal two-thirds, with mid-lobe abruptly recurved, 10-13 mm x 3-4 mm when flattened, the apex of mid-lobe often white; lateral lobes more or less oblong to oblong-elliptical, much longer than the mid-lobe, 6-7.5 mm x c. 1.8 mm, incurved; mid-lobe almost quadrate, 3.5-5 mm x 3.5-5 mm, thin-textured, the margins irregularly sinuate, and apex acuminate caudate, often curved to one side; callus of three tall narrow ridges, often dark purple, intensely and irregularly sinuate in the proximal quarter, extending to the centre of the mid-lobe. **Column** 2.5-3 mm x 2-2.5 mm, porrect from the end of the ovary, glabrous, dorsally lacerate to erose; column foot 4.5-5.5 mm x c. 1.5 mm, at about 90° to the column, shallowly channelled, glabrous. **Stigma** oblong c. 1.2 mm x 1.8 mm, deeply sunken. **Anther** c. 1.5 mm x 1.5 mm, with a short, decurved, lacerate rostrum. **Pollinia** clavate,

falcate, c. 1 mm long, orange, waxy. **Capsule** not seen. **Plate 4B & C.**

FLOWERING PERIOD: June-July and February; cultivated plants may flower sporadically. The flowers last 5-10 days and are not self pollinating.

ILLUSTRATIONS: plate 17, top LHS & page 319, O'Byrne (1995) - as *Dendrobium* aff. *teretifolium* D548.

DISTRIBUTION: Papua New Guinea, where known from localities in the Central and East New Britain Provinces (O'Byrne 1995), and Morobe Province.

HABITAT: On exposed *Casuarina* trees. Altitude: 40-c. 900 m.

RECOGNITION: *Dockrillia caudiculata* is characterised by the following combination of features; relatively small, widely opening (20-25 mm across), creamy yellow flowers with red spots and purple suffusions on the labellum; widely spreading, narrowly linear-obovate petals (12-14 mm x c. 0.8 mm), often bent or kinked near the acute apex; labellum lateral lobes much longer than the mid-lobe; and having mid-lobe short with a prominent, acuminate apical tail.

AFFINITIES: *Dockrillia caudiculata* has affinities with *D. flagella* (Schltr.) Rauschert from Papua New Guinea, but the latter species has much shorter labellum lateral lobes and an elongated mid-lobe which lacks the acuminate apiculus of *D. caudiculata*.

CONSERVATION STATUS: Relatively widespread and common.

ETYMOLOGY: From the Latin *caudicula*, possession of a little tail, in reference to the labellum apex.

SPECIMENS EXAMINED: cult., ex New Guinea, 29 Jan. 1990, M.A. Clements 5825 (CBG 9013606).

Dockrillia convoluta M.A.Clem. et D.L. Jones, spec. nov.

affinis *D. hepaticae* M.A.Clem. et D.L. Jones sed floribus flavescentibus manifeste maculatis et atro-rubro suffusis; labello atro-rubro marginibus fuscatis, comparate magno (ad 13 x 6 mm), apice longi-acuminato flavescenti, lobo medio ovato-elliptico marginibus incisus convolutis, et massa convolutissima porcarum callosarum flavarum, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 29 Jul. 1996, M.A. Clements 8592 (Holotype CANB). **PROVENANCE:** plant originally collected in the Kaisipi Swamp, c. 27 km N of Waitarpi, Central Province, Papua New Guinea, 1975, P. Spence.

Pendulous epiphyte forming sparse clumps to about 1m long. **Aerial roots** absent. Stems straight, 3-8 cm x 1-2 mm, becoming yellow-brown on senescence. **Leaves** linear-terete, 10-30 cm x 3-4 mm, pendulous, dark green. **Racemes** 5-7 cm long, wiry, arising singly from nodes at the leaf base, bearing 3-7 flowers. **Pedicels** 8-12 mm long, filiform. **Ovary** 1-2 mm long, hardly developed at anthesis. **Flowers** 25-30 mm across, opening widely, yellowish, heavily spotted, striped and suffused with dark red; labellum dark red, margins darker, apex yellow. **Dorsal sepal** very narrowly ovate-lanceolate, 10-14 mm x 2.5-3 mm, obliquely erect; apex long-acuminate. **Lateral sepals** asymmetrically lanceolate, very strongly falcate, 10-14 mm x 3.5-4 mm, divergent; apex acuminate. **Petals** narrowly elliptical-lanceolate, 10-14 mm x c. 1.3 mm, spreading; apex attenuate. **Labellum** thick textured, porrect in the proximal half, distal half strongly recurved, 9-13 mm x 4-6 mm



when flattened; lateral lobes elliptic-oblong, 6-7 mm x 2 mm, incurved, outer margins papillate; mid-lobe ovate-elliptic, 5.5-6 mm x 4.5-5 mm, margins strongly incised and convolute, papillate, apex long-acuminate; callus of three yellow ridges, inner ridge narrow and straight in the distal half, outer ridges very broad (c. 0.5 mm wide), curving outwards near the base, then inwards towards the mid-lobe, becoming intensely convolute on the mid-lobe, ending nearly at the apex, 3 or 4 pairs of irregular ridges radiating to the marginal folds. **Column** yellowish with reddish markings, 2.5-3 mm x 2 mm, porrect from the end of the ovary, glabrous, the wings lacerate, extending about half way up the anther; column foot 4-4.5 mm x 2 mm, at about 10° to the column, curved, broadly channelled, glabrous. **Stigma** c. 2 mm x 1.5 mm, sunken. **Anther** 1.5 mm x 1.5 mm, brownish with purplish markings, with a lacerate rostrum. **Pollinia** oblong c. 1.2 mm long, orange, waxy. **Capsule** not seen. **Fig. 3 & Plate 5C.**

FLOWERING PERIOD: Cultivated plants flower from July to November. The flowers last 3-5 days and are not self pollinating.

DISTRIBUTION: Papua New Guinea where presently known only with certainty from the type locality.

HABITAT: Epiphytic on *Casuarina* trees in open swamp-land.

RECOGNITION: *Dockrillia convoluta* is characterised by the following combination of features; flowers yellowish, heavily spotted and suffused with dark red; labellum relatively large (to 13 mm x 6 mm), dark red with darker margins, papillate, with a yellowish long-acuminate apex, with prominent lateral lobes and, an ovate-elliptic mid-lobe with incised and convoluted

margins; and, an extremely convoluted mass of callus ridges on the labellum mid-lobe.

AFFINITIES: *Dockrillia convoluta* has some affinities with *D. hepatica* M.A. Clem. & D.L. Jones from Papua New Guinea, but the latter species has a much smaller labellum with an ovate-deltate mid-lobe.

CONSERVATION STATUS: Unknown.

NOTES: The flowers are fragrant in warm weather.

ETYMOLOGY: From the Latin *convolutus*, convolute irregularly coiled, in reference to the labellum mid-lobe margins and callus.

Dockrillia delicata M.A.Clem. & D.L. Jones, sp. nov.

affinis *Dendrobii bowmanii* Benth. sed racemis 2-6 cm longis floribus 5-8; floribus parvis (c. 15 mm latis) cremeis vel albis; sepalo dorsali ad 7 x 3 mm; sepalis lateralibus ad 9 x 3.5 mm; petalis ad 9 x 1.5 mm; labello ad 12 x 4.5 mm; et labelli callo prominente ex porcis 5 altis irregulariter sinuatis in lobo medio, 3 ad apicem extensis, constante, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 2 Feb. 1994, M.A. Clements 7280 (Holotype CANB; Isotype CANB, NCBG). **PROVENANCE:** plant originally collected on Hoop Pine near Bulolo, Morobe Province, Papua New Guinea, 1989, N.H.S. Howcroft.

Pendulous epiphyte forming sparse clumps to about 1m long. Aerial roots absent. Stems straight, 2-8 cm x 1-1.5 mm, becoming yellow-brown on senescence. **Leaves** linear-terete, 2-10 cm x 3-4 mm, erect to pendulous, dark green. **Racemes** 2-6 cm long, wiry, arising singly from nodes at the leaf base, bearing 5-8 flowers. **Pedicels** 12-15 mm long, filiform. **Ovary** 1-2 mm long, hardly developed at anthesis. **Flowers**

about 15 mm across, not opening widely, fragrant, cream to white with some faint reddish markings towards the centre. **Dorsal sepal** oblong, 6-7 mm x c. 3 mm, erect to obliquely-erect, subobtuse. **Lateral sepals** asymmetrically oblong-obovate, widely divergent; apex subacute. **Petals** very narrowly obovate, porrect to obliquely-erect; apex subacute. **Labellum** curved in proximal two-thirds, with mid-lobe spreading nearly at right angles, 10-12 mm x 4-4.5 mm when flattened, cream with minute red dots and irregular lines towards the margins; lateral lobes more or less elliptic, 7-8 mm x c. 1.3 mm, incurved; mid-lobe ovate-elliptic, 3.5-4 mm x 4-4.5 mm, thin-textured, with margins strongly sinuate-crispate, and apex broadly obtuse to emarginate; callus of five tall narrow ridges, becoming sinuate on the mid-lobe, the central three ridges extending to the labellum apex. **Column** 3-3.5 mm x c. 2 mm, porrect from the end of the ovary, glabrous; column foot 4.5-5.5 mm x c. 1 mm, at about 120° to the column, shallowly channelled, glabrous. **Stigma** oblong, c. 3 mm x 1.5 mm, deeply sunken. **Anther** c. 1 mm x 1 mm, with a short, decurved, lacerate rostrum. Pollinia clavate, falcate 0.8-0.9 mm long, orange, waxy. **Capsule** not seen. **Fig. 4 & Plate 5A & 5B.**

FLOWERING PERIOD: Cultivated plants flower mostly in February and March. The flowers last 3-5 days and are not self pollinating.

DISTRIBUTION: Papua New Guinea, Morobe Province.

HABITAT: Epiphytic on *Araucaria cunninghamii*. Altitude: 900-2000 m.

RECOGNITION: *Dockrillia delicata* is characterised by the following combination of features; relatively small, erect to pendulous leaves (2-10 cm x 3-4 mm); small

(c. 15 mm across) cream to white, widely opening flowers in 5-8-flowered racemes 2-6 cm long; small tepals (dorsal sepal to 7 x 3 mm; lateral sepals to 9 x 3.5 mm; petals to 9 x 1.5 mm; labellum to 12 x 4.5 mm); and strongly developed labellum callus of five tall ridges, these irregularly sinuate on the mid-lobe, three extending to the labellum apex.

AFFINITIES: *Dockrillia delicata* has close affinities with *Dendrobium bowmanii* Benth. from eastern Australia, both having similar growth habit, leaves and flowers. *D. bowmanii* has larger flowers, borne singly or in pairs, green to yellow, finely striped tepals and the labellum callus has three keels.

CONSERVATION STATUS: Unknown as the species is not well recorded.

ETYMOLOGY: From the Latin *delicatus*, delicate, in reference to the delicate growth habit and flowers.

Dockrillia fuliginosa M.A.Clem. et D.L. Jones, *spec. nov.*

affinis *Dendrobium brevicauda* D.L. Jones & M.A. Clem. a qua planta minor; floribus coracinis usque atris, sepalis oblongiellipticis; petalis perlatoribus oblongiellipticis, labello base per 90° flexo, labello lobis lateralibus perreductis er lobo mediano persaucto er cristis calli tenuibus sinuatis, differt.

TYPE: cultivated at Sydney, 23 Sep. 1995, M.A. Clements 8540 (Holotype CANB; Isotype CANB, NCBG). **PROVENANCE:** plant originally collected at the Kaisipi swamp c. 27 km N of Waitarpi, Central Province, Papua New Guinea, 1975, P. Spence.

Pendulous epiphytic **herb** forming sparse clumps to about 50 cm long. **Aerial roots** absent. **Stems** straight, 3-10 cm x 1-2 mm,



becoming yellow-brown on senescence. **Leaves** linear-terete, 10-20 cm x 3-4 mm, pendulous, dark green. **Racemes** 3-5 cm long, wiry, arising singly from nodes at the leaf base, bearing 3-6 flowers. **Pedicels** 5-8 mm long, filiform. **Ovary** 1-2 mm long, hardly developed at anthesis. **Flowers** about 2 cm across, not opening widely, with a musty fragrance, dark purplish-black to sooty black, with some faint light mottling towards the ends of the tepals. **Dorsal sepal** linear oblong-elliptic, 18-20 mm x 4.5-5.5 mm, narrowed to the base, obliquely erect; margins incurved distally. **Lateral sepals** asymmetrically linear-oblong, 17-19 mm x 4.5-5.5 mm, falcate, divergent, margins incurved distally; apex subacute. **Petals** broadly elliptical-oblong, 18-20 mm x 6-7 mm, incurved over the column and labellum; margins slightly irregular; apex subacute. **Labellum** with a strong right-angled bend near the base, bringing the lateral lobes into close proximity with the column, then porrect, 15-17 mm x 6-7 mm when flattened; lateral lobes more or less semicircular, 3-4 mm x c. 1.5 mm, incurved; mid-lobe elliptic, 12-13 mm x 6-7 mm, thin-textured, with margins strongly sinuate, and apex subacute to subacuminate; callus of three narrow ridges, irregularly sinuate in the distal half, extending as faint lines nearly to the apex. **Column** 1.5-2.5 mm x 1.5-1.8 mm, porrect from the end of the ovary, glabrous; column foot 4-5 mm x c. 1 mm, at about 90° to the column, shallowly channelled, glabrous. **Stigma** c. 1.8 mm x 1.5 mm, deeply sunken. **Anther** c. 2 mm x 2 mm, with a short, decurved, lacerate rostrum. **Pollinia** clavate, falcate, c. 1 mm long, orange, waxy. **Capsule** not seen. **Fig. 5 & Plate 6A.**

FLOWERING PERIOD: Cultivated plants

flower mostly in spring. The flowers last 5-10 days and are not self pollinating.

DISTRIBUTION: Papua New Guinea where presently known only with certainty from the type locality.

HABITAT: Epiphytic on *Casuarina* trees on the margins of, and in, open swampland.

RECOGNITION: *Dockrillia fuliginosa* is characterised by the following combination of features; flowers not opening widely, with a musty fragrance, dark purplish-black to sooty black, with some faint light mottling towards the ends of the tepals; broad (to 7 mm wide) perianth segments; labellum with a strong right-angle bend near the base; labellum lateral lobes very short (to 4 mm long), more or less semicircular; and, mid-lobe elliptic, (to 13 x 7 mm), with strongly sinuate margins.

AFFINITIES: *Dockrillia fuliginosa* is a very distinctive species with no obvious affinities to any other species of *Dockrillia*.

NOTES: This striking species has been known under the cultivar name of *Dendrobium* 'Black Pam' for many years in Australia. In Sydney it is easily cultivated and flowers well if maintained in a shadehouse.

CONSERVATION STATUS: Possibly restricted to the Kaisipi Swamp area but the species is not well recorded and probably more widespread.

ETYMOLOGY: From the Latin *fuliginous* dirty brown to almost black or sooty, in reference to the colour of the flowers.

Dockrillia hepatica M.A.Clem. et D.L. Jones, spec. nov.

affinis *D. flagellae* (Schltr.) Rauschert sed floribus c. 2 cm latis, virido-cremeis valde

maculatis et atro-rufis suffusis; petalis anguste elliptico-lanceolatis, attenuatis; labello comparate parvo (ad 10 x 4 mm), atro-rufo, papillato, lobis lateralibus prominentibus, lobo medio anguste ovato-triangulari, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 20 Aug. 1994, M.A. Clements (Holotype CANB). **PROVENANCE:** plant originally collected at the Upper Watut River, 13 km SSW of Bulolo, Morobe Province, Papua New Guinea, 22 Aug. 1982, E.M. Canning 5182.

Pendulous epiphyte forming sparse clumps to about 1m long. **Aerial roots** absent. Stems straight, 3-7 cm x 1-2 mm, becoming yellow-brown on senescence. **Leaves** linear-terete, 10-20 cm x 5-6 mm, pendulous, dark green. **Racemes** 2-4 cm long, wiry, arising singly from nodes at the leaf base, bearing 3-5 flowers. **Pedicels** 4-7 mm long, filiform. **Ovary** 1-2 mm long, hardly developed at anthesis. **Flowers** about 2 cm across, opening widely, greenish cream heavily spotted and suffused with dark red; labellum dark red with a blackish red apex. **Dorsal sepal** very narrowly ovate-lanceolate, 12-14 mm x 2.3-2.5 mm, erect to recurved; apex long-acuminate. **Lateral sepals** asymmetrically lanceolate, very strongly falcate, 12-14 mm x 3.5-4.5 mm, divergent; apex obtusely acuminate. **Petals** narrowly elliptical-lanceolate, 11-12 mm x c. 1.5 mm, porrect to incurved over the column and labellum; apex attenuate. **Labellum** thin textured, porrect in the proximal four-fifths, with apex recurved at right angles or more, 8.5-10 mm x 3.5-4 mm when flattened; lateral lobes more or less oblong, 5-6 mm x 1.5 mm, incurved, with outer margins papillate; mid-lobe narrowly ovate-deltate,

3.5-4 mm x 2-2.5 mm, thin-textured, with margins strongly convolute, and apex subacuminate; callus of three narrow, very tall ridges, c. 0.5 mm high, becoming sinuate on the mid-lobe, ending half to three quarters the distance to the apex. **Column** 1.5-2.5 mm x 1.5-1.8 mm, porrect from the end of the ovary, glabrous; column foot 4-5 mm x c. 1 mm, at about 10° to the column, shallowly channelled, glabrous. **Stigma** c. 1.8 mm x 1.5 mm, deeply sunken. **Anther** 1 mm x 1 mm, with a lacerate rostrum. **Pollinia** oblong c. 0.9 mm long, orange, waxy. **Capsule** not seen. **Plate 6B & C.**

FLOWERING PERIOD: Cultivated plants flower in spring. The flowers last 3-5 days and are not self pollinating.

DISTRIBUTION: Papua New Guinea; Morobe Province, where known with certainty only from the type locality.

HABITAT: Epiphyte on trees along ridges in forests dominated by *Castanopsis* and *Ternstroemia*.

RECOGNITION: *Dockrillia hepatica* is characterised by the following combination of features; flowers about 2 cm across, greenish cream heavily spotted and suffused with dark red; petals narrowly elliptical-lanceolate with an attenuate apex; labellum relatively small (to 10 x 4 mm), dark red, papillate, with a blackish red apex, with prominent lateral lobes and, a narrow, ovate-deltate mid-lobe.

AFFINITIES: *Dockrillia hepatica* has some affinities with *D. flagella* (Schltr.) Rauschert from Papua New Guinea, but the latter species has cream flowers, the petals lack an attenuate apex and the labellum is larger with prominently elliptic lateral lobes.

CONSERVATION STATUS: Unknown.



ETYMOLOGY: From the Latin *hepaticus*, liver coloured, in reference to the colour of the flowers.

Dockrillia nothofageti M.A.Clem. et D.L. Jones, spec. nov.

affinis *D. flagellae* (Schltr.) Rauschert sed floribus magnis (35 mm latis), cremeo-albis, tepalis subtiliter striatis; labelli lobis lateralibus dente apicali anguste lineari, lobo medio ovato-elliptico porcis 3 callosis ad apicem extendentibus; et columnae alis angustis acuminatis antheram excedentibus, differt.

TYPE: Papua New Guinea; Western Highlands Province, 24 miles (38.4 km) from Wabag, Wabag-Laiagam road, 5°25'S, 143° 25'E, alt. 9000 ft. (c. 2500 m), 20 July 1962, J.S. Womersley NGF 15210 (Holotype CANB 113530).

Pendulous epiphytic **herb** forming clumps to about 1m long. **Aerial roots** absent. **Stems** straight, 2-8 cm x 1-2 mm, becoming yellow-brown on senescence. **Leaves** linear-terete, 10-20 cm x 3-4 mm, pendulous, dark green. **Racemes** 1-4.5 cm long, moderately stout, arising singly from nodes at the leaf base, bearing 3-12 flowers. **Pedicels** 9-10 mm long, filiform. **Ovary** 1-2 mm long, hardly developed at anthesis. **Flowers** about 3.5 cm across, opening widely, creamish-white with fine dark striae. **Dorsal sepal** linear-oblong, 12-15 mm x c. 3 mm, obliquely erect. **Lateral sepals** asymmetrically linear-oblong 17-21 mm x 3.5-4 mm, straight, divergent; apex obtuse. **Petals** narrowly oblong-obovate 15-17 mm x c. 2 mm, obliquely erect; apex subacute to obtuse. **Labellum** porrect in proximal two thirds, with mid-lobe spreading to recurved, 11.5-12.5 mm x c. 3-3.5 mm when flattened; lateral lobes more or less oblong, c. 8 mm x c. 1.5 mm, incurved, ending in a

narrow, tooth-like lobe; mid-lobe elliptic to ovate, c. 4 mm x c. 3 mm, thin-textured, with margins strongly sinuate, and apex obtuse; callus of three narrow ridges, irregularly convolute-sinuate on the mid-lobe, extending to the labellum apex. **Column** c. 3.5 mm x c. 2 mm, porrect from the end of the ovary, glabrous, with narrow wings extending higher than the anther; column foot c. 4.5 mm x c. 1 mm, at about 140° to the column, shallowly channelled, glabrous. **Stigma** c. 1.5 mm long, deeply sunken. **Anther** c. 1.5 mm x 1.5 mm, with a deflexed rostrum. **Pollinia** not seen. **Capsule** not seen.

Fig. 6.

FLOWERING PERIOD: July.

DISTRIBUTION: Papua New Guinea; Western Highlands Province, where known with certainty only from the type locality.

HABITAT: On lower side of branches of *Nothofagus carri* Steenis. Altitude: c. 2800 m.

RECOGNITION: *Dockrillia nothofageti* is characterised by the following combination of features; large (35 mm across), creamy-white flowers with tepaline striae; labellum lateral lobes ending in narrow linear teeth; an ovate-elliptical mid-lobe with the three callus ridges extending to the labellum apex; and column with narrow acuminate wings extending above the anther.

AFFINITIES: *Dockrillia nothofageti* is a very distinctive species with no obvious affinities to any other *Dockrillia* known to us.

CONSERVATION STATUS: Unknown.

ETYMOLOGY: Specific epithet refers to the habit of the growing on *Nothofagus*.

NEW COMBINATIONS

In recognising certain genera in the Dendrobiinae Lindl. distinct from *Dendrobium* sens. str., as proposed by Brieger (1981), the following new combinations are necessary.

Dockrillia Brieg. in Schltr., Die Orchideen 3(1): 745 (1981). Type species: *Dendrobium linguiforme* Sw. (fide Brieger)

Dockrillia bowmanii (Benth.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Dendrobium bowmanii* Benth., Fl. Austral. 6: 286 (1873). Types: 'Bersaker range and Port Cooper', Bowman s.n. (Lectotype K!; Isolectotype MEL! W!, fide Clements 1989).

Dendrobium striolatum Rchb.f. var. *chalandei* Finet, Bull. Soc. Fr. 50: 380 (1903); *Dendrobium chalandei* (Finet) Kraenzl., Pflanzenreich Orch.-Mon.-Dendr. 1: 299 (1910). Type: New Caledonia, 12 Sep. 1884, Chalande s.n. (Holotype P!).

[*Dendrobium mortii* auct., non F. Muell; Dockr., Austral. Indig. Orchids 1: 360, t. (1969)]

Distribution: Australia; Queensland and New South Wales, and New Caledonia.

Dockrillia brevicauda (D.L. Jones et M.A. Clem.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Dendrobium brevicaudum* D.L. Jones et M. Clements, Novon 4(2): 109-111, f. 1 (1994). Type: 'Australia. Queensland: Cook District, Mt. Finnigan, S of Cooktown', 31 Mar. 1993, C.H. Broers 422 & L. Roberts (Holotype CBG!; Isotype CBG!, BRI!).

Distribution: Australia; Queensland.

Dockrillia calamiforme (Lodd.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Dendrobium calamiforme* Lodd. in Edwards's, Bot. Reg. 27: Misc. 9, no. 26 (1841). Type: cult. ex New Holland, Loddiges s.n. (Lectotype K-L!, fide Clements 1989).

Dendrobium baseyanum St. Cloud, North Queensland Naturalist 23(110): 1-2, f. (1955); *Dockrillia baseyana* (St. Cloud) Rauschert, Feddes Repert. 94(7-8): 446 (1983). Type: 'Kings Plains, North

Queensland', F.L. Basey s.n. (Holotype QRS?, lost).

Dendrobium teretifolium R. Br. var. *fasciculatum* Rupp, Proc. Linn. Soc. New South Wales 60: 157, t. 4 (1935). Type: North Queensland, Cairns?, Aug. 1934, Tierney & H. Flecker s.n. (Holotype NSW!).

Dendrobium teretifolium R. Br. var. *album* C. White, Proc. Roy. Soc. Queensland 47: 82 (1936). Type: cult., 6 Oct. 1933, B.D. Grimes ex Mount Spec, North Queensland, B.D. Grimes s.n. (Holotype BRI!).

Distribution: Australia; Queensland.

Dockrillia casuarinae (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Dendrobium casuarinae* Schltr., Repert. Spec. Nov. Regni Veg. 15: 211 (1918). Type: New Caledonia, Yaouhe, 100 m, 29 Sept. 1902, R. Schlechter 14728 (Holotype B†; Isotypes BM!, P!, Z!).

Synonym: *Dendrobium daenikerianum* Kraenzl., Veitr. Nat. Ges. Zurich 74: 82 (1929). Type: New Caledonia, Mt Koghis, 19 July 1925, A.E. Däniker 1858 (Holotype Z!).

[*Dendrobium sylvanum* auct., non Rchb.f.; N. Hallé, Fl. Nouv. Caled. Depend., Orchid. 8: 142 (1977)]

Distribution: New Caledonia.

Dockrillia dolichophylla (D.L. Jones et M.A. Clem.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Dendrobium dolichophyllum* D.L. Jones et M.A. Clem., Aust. Orch. Res. 1: 52 (1989). Type: 'O'Reilly's property, Green Mountains, Queensland', 9 Sep. 1987, C.W. Harman s.n. (Holotype CBG!; Isotype BRI!).

Synonym: *Dendrobium teretifolium* R. Br. var. *aureum* F.M. Bailey, Queensl. fl. 5: 1534 (1902); *Dendrobium teretifolium* R. Br. var. *fairfaxii* Fitzg. ex F. Muell. forma *aureum* (F.M. Bailey) Clemesha, Orchadian 2: 11 (1965). Type:



cult. Balmain, Oct. 1888 ex 'Richmond River', J. Geary s.n. (Lectotype BRI!).

Distribution: Australia; Queensland and New South Wales.

Dockrillia nugentii (F.M. Bailey) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium linguiforme* Smith var. *nugentii* F.M. Bailey, *Queensl. fl.* 6: 1533 (1902); *Dendrobium nugentii* (F.M. Bailey) D.L. Jones et M.A. Clem., *Aust. Orch. Res.* 1: 58 (1989). Type: 'Eungella Range', Aug-Sep. 1894, L.J. Nugent s.n. (Holotype BRI!; Isotype K!).

Distribution: Australia; Queensland.

Dockrillia schoenina (Lindl.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium schoeninum* Lindl., *Gard. Chron.* 7 (1846). Type: cultivated ex 'New Holland', Loddiges 390 (Holotype K-L!; Isotype W!).

Dendrobium beckleri F. Muell., *Fragm.* 7: 59 (1869); *Dendrobium striolatum* Reichb.f. var. *beckleri* (F. Muell.) F.M. Bailey, *Syn. Queensl. fl. Suppl.* 1: 55 (1886); *Callista beckleri* (F. Muell.) Kuntze, *Revis. gen. pl.* 2: 654 (1891); *Dockrillia beckleri* (F. Muell.) Rauschert, *Feddes Repert.* 94(7-8): 446 (1983). Types: 'Ad flumen Clarence River', H. Beckler s.n. (Lectotype MEL!, fide Clements 1989).

Distribution: Australia; Queensland and New South Wales.

Grastidium Blume, *Bijdr.* 7: 333 (1825). Type species: *Grastidium salaccense* Blume.

Grastidium tozerensis (Lavarack) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium tozerensis* Lavarack, *Austrobaileya* 1: 70, f. 5 (1977). Type: 'Tozer's Gap, Cape York Peninsula', 11 Aug.

1975, P.S. Lavarack 990 (Holotype & Isotype BRI!).

Distribution: Australia; Queensland.

ACKNOWLEDGMENTS

The authors wish to express their sincere thanks for the support of the Nell and Hermon Slade Trust, the Australian Orchid Foundation and the Christenson Research Institute; Matthew Jebb, Simeon Obedi, Alberto Kairo and the elders of the Korepovillage, Morobe Province and Neville Howcroft for their generous help and assistance during our short visit to the area; Phil Spence for plant material; Marion Garratt, Maggie Nightingale and Karina Fitzgerald for technical assistance; Robin Hill, Melissa Ogden and Marion Garratt for illustrations; Lyn Craven and Alex George for the Latin translations.

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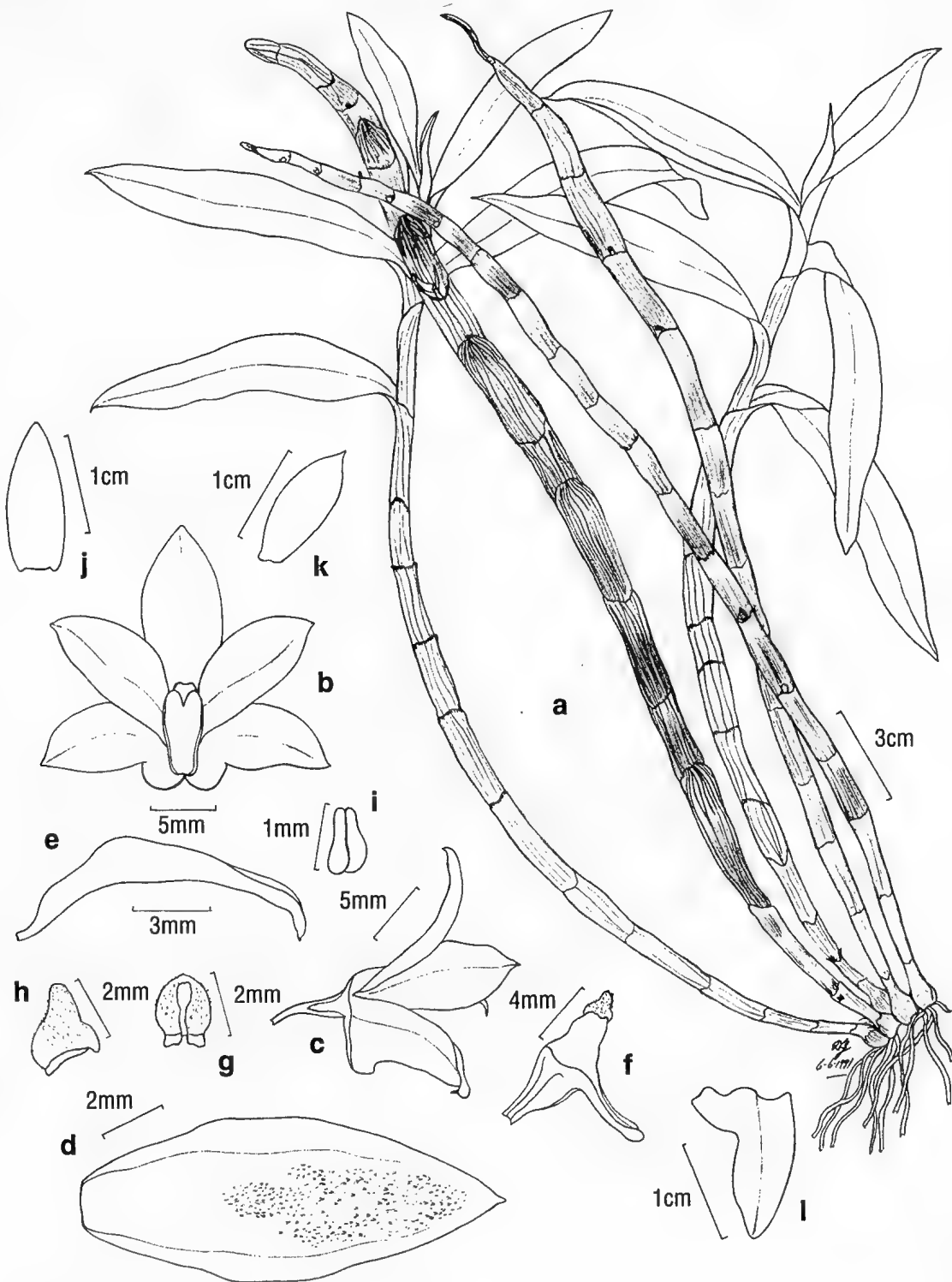


Figure. 2. *Dendrobium vesiculosum*, Waria River Valley, Papua New Guinea, Clements 6631: **a.** plant: **b.** flower from the front: **c.** flower from the side: **d.** labellum flattened viewed from above: **e.** labellum from the side: **f.** dorsal sepal: **g.** petal: **h.** lateral sepal: **i.** column from side: **j.** anther cap from side: **k.** anther cap from the front: **l.** pollinium.

Figure 3. *Dockrillia convoluta*, Papua New Guinea; Central Province, Clements 8592: a. flattened labellum.

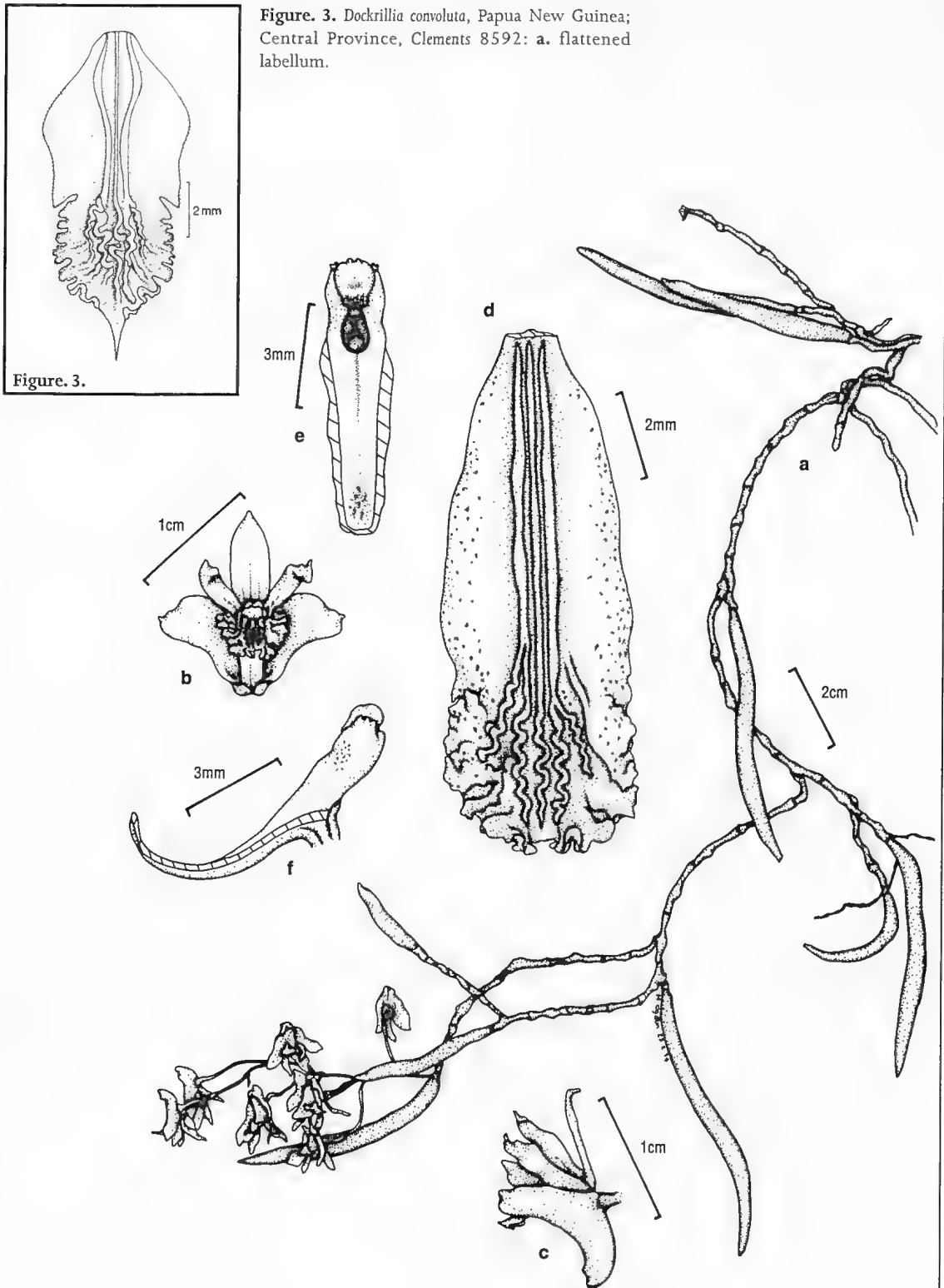


Figure 4. *Dockrillia delicata*, Papua New Guinea; Morobe Province, Clements 7280: a. plant: b. flower from front: c. flower from side: d. labellum flattened: e. column from front: f. column from side.

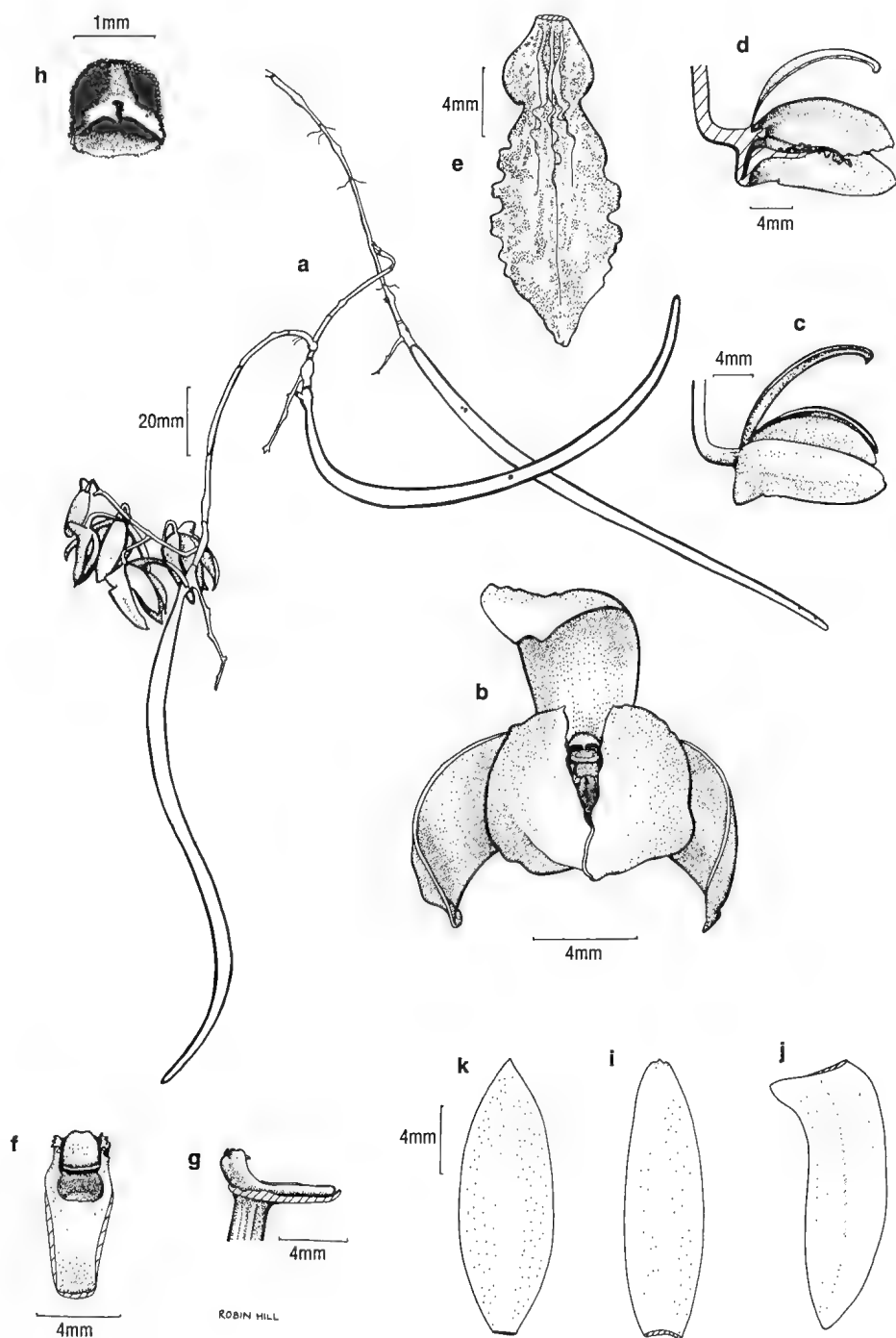


Figure 5. *Dockrillia fuliginosa*, Kaisipi Swamp, Papua New Guinea, Clements 8540: **a.** part of a plant: **b.** flower from the front: **c.** flowers from the side: **d.** median section through flower: **e.** flattened labellum: **f.** dorsal sepal: **g.** lateral sepal: **h.** petal: **i.** column from the front: **j.** column from the side: **k.** anther cap from the front.

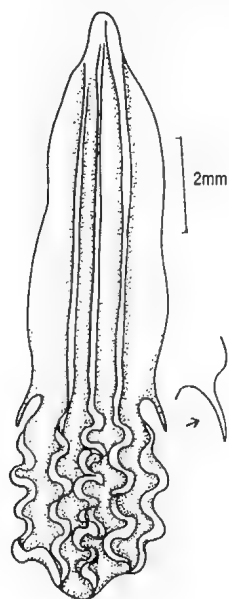


Figure. 6. *Dockrillia nothofageti*, Papua New Guinea; Wabag-Laiagam road, Womersley NGF 15210; **a.** flattened labellum.

Plate 3. *Dendrobium vesiculosum*, Clements 6631





Plate 4A.

Dendrobium vesiculosum, Clements 6631



Plate 4B.

Dockrillia caudiculata, Clements 7284



Plate 4C.

Dockrillia caudiculata, Clements 5825



Plate 5A. *Dockrillia delicata*, Clements 7280

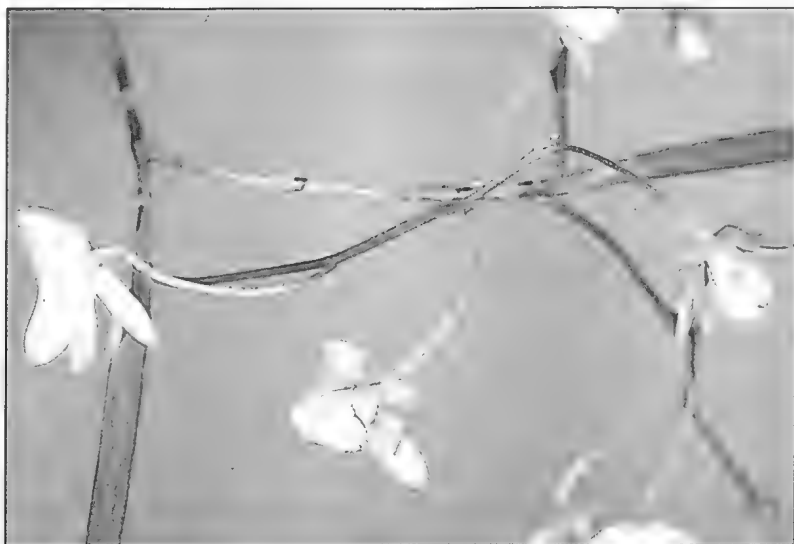


Plate 5B. *Dockrillia delicata*, Clements 7280



Plate 5C. *Dockrillia convoluta*, Clements 8592

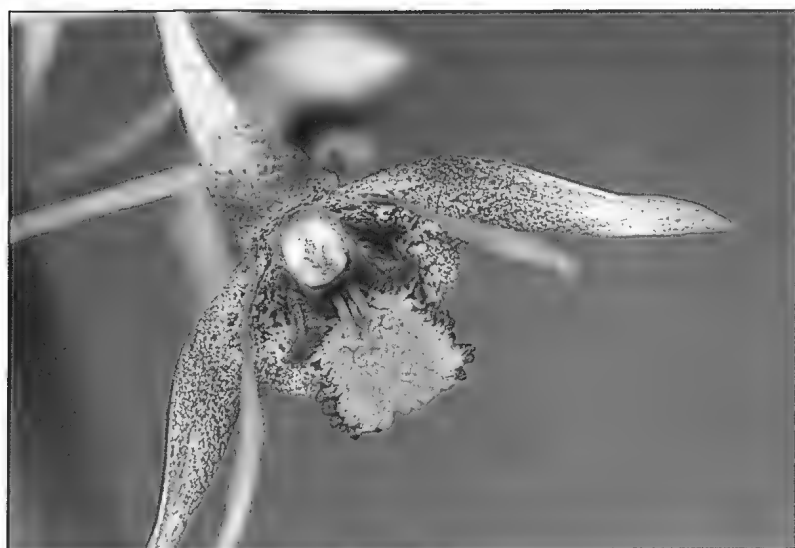




Plate 6A.

Dockrillia fuliginosa, Clements 8540



Plate 6B. *Dockrillia hepatica*, Canning 5182

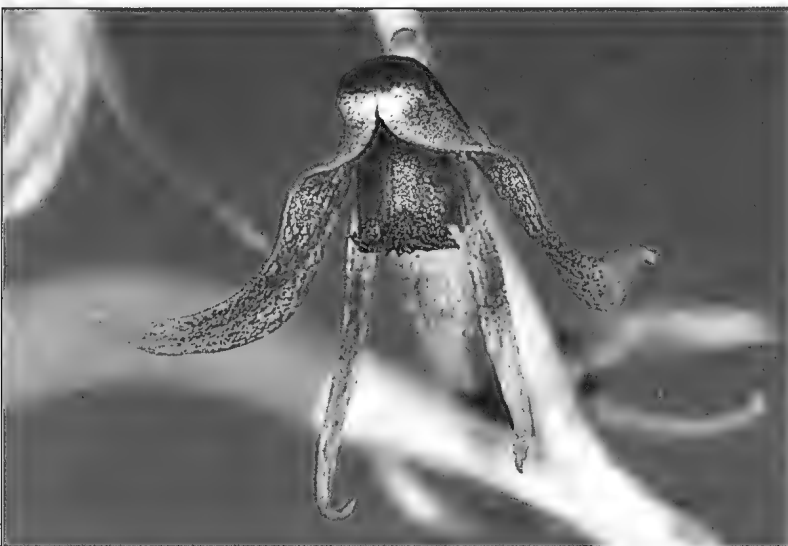


Plate 6C. *Dockrillia hepatica*, Canning 5182

1 NCBG = National Capital Botanical
Gardens, PO Box 7270, Boroko NCD,
Papau New Guinea.





CONSPECTUS OF CYMBIDIUM (ORCHIDACEAE) IN PAPUA NEW GUINEA WITH THE DESCRIPTION OF A NEW SPECIES

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ABSTRACT:

The status of species of *Cymbidium* occurring in Papua New Guinea is reviewed. Four species are recognised; *C. lancifolium*, *C. papuanum* (here reinstated), *C. robustum* (doubtfully distinct from *C. lancifolium*) and *C. acuminatum* (described as new). A key to these species is provided as are details of their taxonomy and ecology.

Reeve (1984) provided a modern account of the genus *Cymbidium* Sw. in Papua New Guinea, detailing three species (*C. ensifolium* (L.) Sw., *C. lancifolium* Hook. and *C. papuanum* Schltr.) and mentioning *C. robustum* A. Gilli in a footnote. The genus was later monographed by Du Puy and Cribb (1988), who recognised only *C. lancifolium* and *C. ensifolium* as occurring in Papua New Guinea. Their treatment is conservative in the extreme, adopting the view of widespread variable taxa and failing to recognise local entities at any level. The result is a masking of the biodiversity exhibited by *Cymbidium* in Papua New Guinea.

A study of the specimens at various herbaria (CBG, K, L, LAE) and field collections by one of us (MAC, see Clements and Ziesing 1990) have convinced us that a reassessment of the genus in Papua New Guinea is needed. In this paper we reinstate *C. papuanum* as distinct from *C. lancifolium* and describe as new the species recorded as *C. ensifolium*. *Cymbidium robustum* is considered doubtfully distinct from *C. lancifolium*, but is maintained in this treatment in the hope that

its status can be elucidated by further collections. A key to the species of *Cymbidium* in Papua New Guinea is provided.

MATERIALS AND METHODS

The description of these new species was made from a range of sources including fresh living plants, dried herbarium specimens, spirit preserved specimens stored in BANG mix (65 % ethanol, 5 % glycerol and 30% water), floral dissection cards and 35 mm colour transparencies of flowers and plants. Specimens were examined from the following herbaria: BRI, CANB, CBG, K, L, MEL, P, W and Z. Herbarium abbreviations follow Holmgren et al. (1990). Unless otherwise indicated, all types (or photographs thereof) and collections cited have been seen.

KEY TO PAPUA NEW GUINEA SPECIES OF CYMBIDIUM

1. Leaves linear, margins serrulate, tepals with c. 5 longitudinal stripes *C. acuminatum*
- 1a. Leaves elliptical-lanceolate to lanceolate, margins entire, tepals not striped or with a single longitudinal stripe 2

2. Plant stoloniferous, leaves small 4-10 cm long, inflorescence extending above the leaves
C. papuanum

2a. Plant clumping, leaves 10-50 cm long, inflorescence not extending above the leaves

3

3. Pseudobulbs to 5 cm wide, labellum apex truncate
C. robustum

3a. Pseudobulbs to 1.5 cm wide, labellum apex acute
C. lancifolium

TAXONOMY

Cymbidium lancifolium Hook., Exot. Flora 1: t. 51 (1823). (Plate 7A).

Type: cult. Liverpool Botanic Gardens, Shepherd ex 'East Indies', Dr. N. Wallich s.n. (Holotype K!).

Synonymy - for a list of synonyms of material collected outside of Papua New Guinea, see Du Puy and Cribb (1988).

DESCRIPTION: See Reeve (1984) and Du Puy and Cribb (1988).

FLOWERING PERIOD: May to August.

ILLUSTRATIONS: page 36, top RHS, Reeve (1984); - page 87, top LHS, Jones (1990); page 58, Zenghong et al. (1993).

DISTRIBUTION: In Papua New Guinea known only from the Enga Province; also widely distributed from Japan, China and northern India to Malaysia and Malesia.

ECOLOGY: Terrestrial in leaf litter on moderate to steep slopes in rainforest dominated by *Castanopsis acuminatissima* (Blume) A.DC. Altitude: 1400-1500 m.

RECOGNITION: In Papua New Guinea *C. lancifolium* is characterised by the following combination of features; clumping habit; subterete pseudobulbs to 15 cm x 1.5 cm; elliptical-lanceolate to lanceolate, petiolate leaves to 50 cm x 5 cm; inflorescence as long

as or, usually, shorter than the leaves; racemes 3-10-flowered; flowers porrect, opening widely; labellum to 18 mm x 8 mm, the apex acute and recurved.

CONSERVATION STATUS: Uncertain.

SPECIMENS EXAMINED: PAPUA NEW GUINEA; Enga Province, Korombi, Paiela, Porgera District, July 1982, T.M. Reeve 702 (AMES!, CBG!, E, K, L, LAE!, NSW).

Cymbidium papuanum Schltr., Repert. Spec. Nov. Regni Veg., Beih. 1: 953 (1913).

Type: 'Kaiser-Wilhelms-Land: [In humus] in the forests of the Bismarck Range, alt. c. 1600 m.', Nov. 1908, R. Schlechter 18680 (Holotype B†).

DESCRIPTION: See Schlechter (1913) and Reeve (1984).

FLOWERING PERIOD: Sporadic.

ILLUSTRATIONS: plate 336, figure 1296 (Schlechter 1928); page 34, 35 & 36, bottom LHS, Reeve (1984); page 248, bottom RHS, Cruttwell (1990).

DISTRIBUTION: Endemic in Papua New Guinea (Western Highlands Province, Southern Highlands Province, Chimbu Province, Madang Province, Eastern Highlands Province, Milne Bay Province).

ECOLOGY: Terrestrial in leaf litter on slopes in montane rainforests dominated by *Castanopsis acuminatissima*. Altitude: 1300-2000 m.

RECOGNITION: *Cymbidium papuanum* is characterised by the following combination of features; stoloniferous habit with long creeping rhizomes producing new plants at intervals; dwarf habit (plants to 18 cm tall); subterete pseudobulbs to 5 cm x 4 mm; inflorescence longer than the leaves; racemes 1-4-flowered; flowers semi-nodding, not opening widely; labellum to 17 mm x 9 mm,



the apex acute and uncinat.

NOTES: Reeve (1984) records that the plants of this species may become dormant and leafless in the dry season.

CONSERVATION STATUS: Uncertain.

SPECIMENS EXAMINED: PAPUA NEW GUINEA; Western Highlands Province; Minj District, Kongonol - Bomol near Nondugl, alt. 1500 m, May 1980, T.M. Reeve 437 (CBG!, E, K!, L, LAE!).

ETYMOLOGY: Derived from its place of origin, Papua New Guinea.

Cymbidium robustum A. Gilli, Ann. Naturhist. Mus. Wein 84/B: 5-47 (1983).

Type: Papua New Guinea, Western Highlands, Chimbu District, often in low bushes at the edge of forests around Kompam, alt. 1650 m, 24 Feb. 1974, A. Gilli 546 (Holotype W).

DESCRIPTION: See Gilli (1983).

FLOWERING PERIOD: February.

ILLUSTRATIONS: Gilli (1983).

DISTRIBUTION: Known with certainty only from the type collection in Papua New Guinea.

ECOLOGY: Terrestrial in rainforest. Altitude: 1650 m.

RECOGNITION: *Cymbidium robustum* is very similar to *C. lancifolium* but can be distinguished by the broader pseudobulbs (to 5 cm wide) and the truncate apex of the labellum.

NOTES: Reeve (1984) considers *C. robustum* to be a variant of *C. lancifolium*. He may well be correct as the description of the two are remarkably similar. However Gilli emphasises the truncate labellum apex. In addition the broad pseudobulbs (to 5 cm broad in the description) are unusual for species in this

section of the genus. Consequently we have retained *C. robustum* in this treatment pending further research and study of fresh material when available.

CONSERVATION STATUS: Uncertain.

ETYMOLOGY: Derived from the Latin *robustus*, strong, robust.

Cymbidium acuminatum M.A. Clem. et D.L. Jones, spec. nov.

affinis C. ensifolii (L.) Sw. sed floribus prominente brunneo-striatis; tepalibus acuminatis; et labelli lobis lateralibus abrupte incurvis parum irregularibus, lobo medio anguste triangulari acuminato, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 22 Dec. 1992, M.A. Clements (Holotype CANB). PROVENANCE: plant originally collected from the hills behind Garassa, Morobe Province, Waria River District, Papua New Guinea, 6 Apr. 1990, M.A. Clements 6387, P.D. Zeising, E. Dauncey, D. Benzing, A. Kairo and O. Simeon.

[*Cymbidium ensifolium* auct., non (L.) Sw.; Reeve, Orchadian 8(2): 33-34, t. (1984)]

Terrestrial **herb** forming dense clumps. **Roots** to 6 mm across, white. **Pseudobulbs** 25-35 mm x 15-25 mm. **Leaves** 3 or 4 per pseudobulb, ligulate to narrowly ensiform, 30-120 cm x 10-23 mm, sessile, erect to arcuate, mid-green, mid-vein carinate abaxially, two other veins prominent, margins serrulate, apex acuminate to long-acuminate. **Racemes** erect, 30-80 cm long, the peduncle much longer than the rachis, 2-7-flowered in the distal third. **Floral bracts** subulate, 10-14 mm x 1.5-2 mm, acuminate. **Pedicel** plus **ovary** 18-23 mm long, slender, obliquely erect to porrect. **Flowers** c. 5 cm across, opening widely, light green to yellow or brownish, with five to

seven prominent dark red longitudinal lines on the tepals, labellum yellow with red spots and suffusions. **Dorsal sepal** linear to ensiform, 13-15 mm x 3-4 mm, incurved over the column, flat, apex often slightly recurved, acuminate. **Lateral sepals** linear to ensiform, 13-15 mm x 3-4 mm, widely divergent, flat; apex acuminate. **Petals** narrowly linear-lanceolate, 18-22 mm x 3-4 mm, porrect and closely flanking the column, flat acuminate. **Labellum** porrect to obliquely deflexed, 18-20 mm x 10-12 mm, deeply three-lobed; lateral lobes bluntly deltate, c. 4 mm wide, erect and flanking the column, entire to slightly irregular; mid-lobe narrowly deltate, recurved in distal third, with margins irregular, and apex long-acuminate. **Lamina callus** consisting of two broad plates, prominent on the lateral lobes, thickening distally, ending in two, incurved, raised lobes in close contact with each other. **Column** linear, curved, 10-12 mm x c. 3 mm, flattened or shallowly channelled anteriorly; wings small extending above the anther. **Anther** c. 2 mm across. **Pollinia** c. 2 mm across, orange, waxy. **Stigma** transversely oblong, c. 2 mm wide, sunken. **Capsule** linear-oblong, 25-30 mm x 8-10 mm, dark green; shallowly ribbed, erect. **Fig. 7 & Plate 7B.**

FLOWERING PERIOD: November to March; also sporadic.

ILLUSTRATIONS: top LHS, page 36, Reeve (1984) - as *Cymbidium ensifolium*; page 52, top plate, Zenghong et al. (1993).

DISTRIBUTION: Endemic to Papua New Guinea (Morobe Province, Southern Highlands Province and Milne Bay Province).

HABITAT: Terrestrial in leaf litter in or along rainforest margins, in forests dominated by *Castanopsis acuminatissima*.

Altitude: 450-1300 m.

RECOGNITION: *Cymbidium acuminatum* is characterised by the following combination of features; tepals with 5-7 prominent dark red stripes and acuminate apices; straight, widely divergent lateral sepals; abruptly incurved labellum lateral-lobes with irregular anterior margins; and, a narrowly deltate labellum mid-lobe with an acuminate apex.

AFFINITIES: *Cymbidium ensifolium* is similar to *C. acuminatum* but has green tepals lacking prominent striping and with subacute to obtuse apices, decurved, falcate lateral sepals, broadly rounded labellum lateral lobes, and an ovate mid-lobe with an obtuse to subacute apex.

NOTES: *Cymbidium ensifolium* occurs throughout south-east Asia. The name has been misapplied to Papua New Guinea plants.

CONSERVATION STATUS: Not known.

ETYMOLOGY: From the Latin, *acuminatus*, in reference to the sharply pointed tepals and labellum apex.

SPECIMENS EXAMINED: PAPUA NEW GUINEA; Southern Highlands Province; Ibu Creek, E of Inu Station, Lake Kutubu, alt. 850 m, Nov. 1982, T.M. Reeve 1174 (CBG! E, K, L, LAE, NSW).



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Plate 7A.

Cymbidium lancifolium, cultivated plant from China, Yunnan Province.

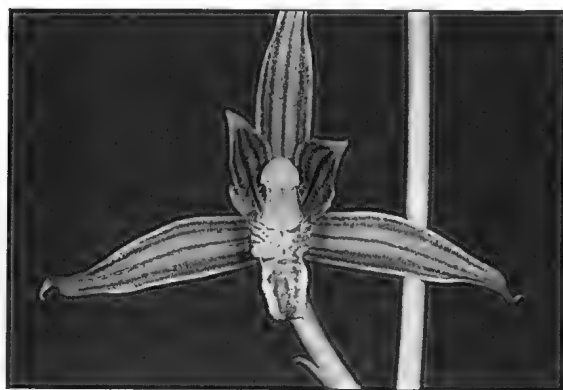


Plate 7B.

Cymbidium acuminatum, Clements 6387.

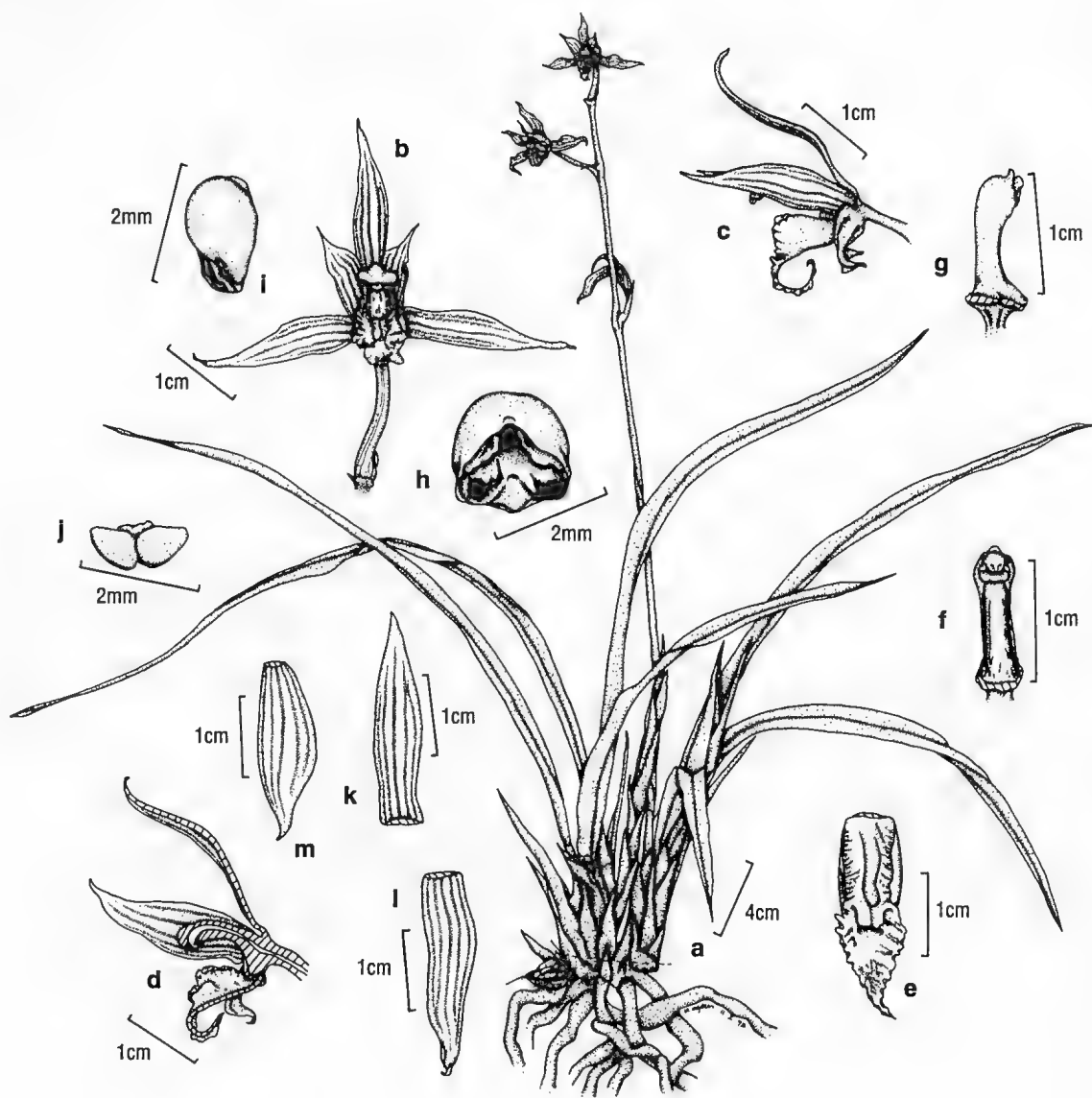


Figure 7. *Cymbidium acuminatum*, Waria River District, Papua New Guinea, Clements 6387: **a.** plant: **b.** flower from front: **c.** flower from side: **d.** longitudinal section through flower: **e.** labellum (not flattened): **f.** column from front: **g.** column from side: **h.** anther from back: **i.** anther from side: **j.** pollinia: **k.** dorsal sepal: **l.** lateral sepal: **m.** petal.



CREPIDIUM MYOSOTIS, A NEW SPECIES OF ORCHIDACEAE FROM PAPUA NEW GUINEA.

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ABSTRACT: A species of *Crepidium* from Papua New Guinea, previously confused with *C. grandifolium*, is described as new. Forty three new combinations in *Crepidium* and six in *Dienia* are made for species in the western and south-west Pacific regions.

Microstylis grandifolia Schltr. (= *Malaxis grandifolia* (Schltr.) P.F. Hunt) was described from material collected at about 180 m. altitude in the primary forests of Kelel in Kaiser-Wilhelms-Land, Papua New Guinea (Schlechter 1911). Schlechter also recorded the species from near the Saugueti Base at an altitude of about 300 m, flowering in December 1908. Schlechter placed *M. grandifolia* in section *Pleiodon* which he distinguished as those species possessing "denticulations on the lateral lobes of the labellum". This group of species, along with those in Schlechter's sections *Pseudo-liparis*, *Oistochilus*, *Bothrocardia*, *Ophthalmodes*, *Hololobus*, *Herpetorhizis* and most in section *Commelinodes*, have since been transferred to the reinstated genus *Crepidium* (Szlachetko 1995). During the Schlechter-Lauterbach Commemorative Expedition, 1989-90 to Papua New Guinea, plants of *Malaxis grandifolia* (*Crepidium grandifolium*) (**Plate 8A**) were collected in the northern end of the Finisterre Range adjacent to the Lae-Madang road, and cultivated in the living collection at the Australian National Botanic Gardens, Canberra (Clements and Ziesing 1990).

When these plants flowered it became obvious that two sympatric species were included in the original collection. One of these was *C. grandifolium* and the other, a similar but undescribed species, is here described as new.

MATERIALS AND METHODS

The description of the new species was made from a range of sources including living plants, spirit-preserved specimens stored in BANG mix (65 % ethanol, 5 % glycerol and 30% water), floral dissection cards and 35 mm colour transparencies of flowers and plants. Specimens were examined from the following herbaria: B, BM, BRI, CANB, CBG, E, G, K, L, LINN, MEL, NSW, P, W and Z. Herbarium abbreviations follow Holmgren et al. (1990). Unless otherwise indicated, all types (or photographs thereof) and collections cited have been seen.

NEW SPECIES

Crepidium myosotis M.A.Clem. & D.L.Jones, sp. nov.

affinis *C. grandifolii* (Schltr.) Szlach. sed floribus longioribus, angustioribus, tepalis

majoribus (sepalo dorsali ad 7.5 x 2.5 mm; sepalis lateralibus ad 6.5 x 3 mm; petalis ad 7.5 x 1.3 mm); sepalis lateralibus late effusis, auriculiformibus labellum subtendentibus; labelli lobis anguste triangularibus, parallelis, auricularibus, c. 4 mm longis; et columna breviori comparate lata (ad 3.5 x 3 mm), differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 31 Jul. 1991, M.A. Clements (Holotype CANB; Isotype NCBG). PROVENANCE: plant originally collected in the Finnisterre Range, near old Yaula, Kofebi River crossing along the Madang-Lae Road, Madang Province, Papua New Guinea, 5° 33'S 145° 40'E, c. 500 m., 3 Apr. 1990, M.A. Clements 6354B & P.D. Ziesing.

Terrestrial **herb** forming loose clumps to c. 50 cm tall, consisting of 2-6 stems. **Stems** subcylindrical, 10-50 cm x 10-14 mm, consisting of 5-15 nodes, semi-erect to erect, straight or curved, narrowed slightly at the base, tapered suddenly near the apex, pale green, partially covered by scarious sheathing bracts. **Leaves** 6-10, semierect to spreading in a flabellate arrangement; **petiole** 2-5 cm x c. 6-10 mm, deeply canaliculate; **lamina** asymmetrically ovate to ovate-lanceolate, 5-20 cm x 2-6 cm, falcate, plicate, margins entire to slightly undulate, apex acute to acuminate. **Inflorescence** 15-40 cm long, erect, many-flowered; **peduncle** extremely short (c. 3-6 cm long), shallowly furrowed, with numerous sterile bracts; sterile bracts very narrowly subulate, 6-14 mm x c. 1.5 mm, the basal ones erect and crowded, the rest spreading or recurved, acute to acuminate; fertile bracts similar but smaller. **Pedicel** plus **ovary** 4-8 mm long, filiform, straight or curved, porrect to suberect. **Flowers** densely crowded, dark

red, 10-11 mm x 7-8 mm. **Dorsal sepal** oblong-spathulate, 6.5-7.5 mm x c. 2.5 mm, erect to recurved; margins strongly revolute; apex broadly obtuse. **Lateral sepals** oblong-obovate, 5.5-6.5 mm x 2.5-3 mm, strongly falcate, divergent, recurved behind the labellum; apex obtusely apiculate. **Petals** narrowly linear-obovate, 6.5-7.5 mm x c. 1.3 mm, spreading or recurved, divergent; margins strongly revolute, apex obtuse. **Labellum** hippocrepiform, 7-8 mm x c. 5.5 mm, at right angles to the rachis, with two erect, narrowly deltate, parallel, auricular lobes c. 4 mm long flanking the column; apical region with six, linear-subulate teeth to 2 mm long. **Column** porrect from the end of the ovary, c. 3.5 mm x c. 3 mm; column wings higher than the anther, obtuse to truncate. **Stigma** transversely ovate, c. 1.8 mm across, sunken. **Anther** ovate, c. 1 mm x c. 1.5 mm, purplish. **Pollinia** obovoid, c. 0.6 mm long, yellow, waxy. **Capsules** not seen. **Fig. 8 & Plate 8B & 9A.**

FLOWERING PERIOD: May-July in cultivation.

DISTRIBUTION: Madang Province, northern end of the Finnisterre Range.

HABITAT: Grows on sheltered southern slopes in leaf litter and volcanic ash over decomposed limestone and mudstone in tropical lowland rainforest. Altitude: c. 500 m.

RECOGNITION: *Crepidium myosotis* is characterised by the following combination of features; long, narrow flowers (to 11 mm x 8 mm); large tepals (dorsal sepal to 7.5 mm x 2.5 mm); lateral sepals to 6.5 mm x 3 mm; petals to 7.5 mm x 1.3 mm), oblong-obovate, widely divergent, subtending the labellum as ear-like structures; auricular labellum lobes, c. 4 mm long; narrowly deltate, parallel; and column relatively broad



and short (to 3.5 mm x 3 mm).

AFFINITIES: *Crepidium myosotis* is similar to *C. grandifolium* which has shorter broader flowers (to 7 mm x 6 mm), smaller tepals (dorsal sepal to 5 mm x 1.8 mm; lateral sepals to 4 mm x 2.5 mm; petals to 4.5 mm x 1 mm), oblong lateral sepals which hardly project beyond the labellum lamina, broadly deltate labellum lobes, and a relatively narrow column (to 2 mm x 1.5 mm).

CONSERVATION STATUS: Not known.

ETYMOLOGY: Derived from the Greek *myos*, mouse and *ous*, *otis*, ear, in reference to the lateral sepals which resemble a mouse's ears.

NEW COMBINATIONS

The majority of species formerly included in the genus *Malaxis* Sw. have recently been transferred to the reinstated genus *Crepidium* Blume, or transferred to newly described genera (Szlachetko 1995). This work, which is substantially supported by our studies, lacks a critical circumscription of *Malaxis* sens. str. and fails to nominate key generic characters for the genera involved. For example, the new genus *Fingardia* Szlach., based on *Microstylis nephroglossa* Schltr., is separated from *Crepidium* only by having a cordate labellum. We regard this as insufficient grounds for a new genus, and not all of the taxa transferred by Szlachetko have this character. As a result *Fingardia* is reduced to a synonym of *Crepidium*.

Szlachletcho (1995) also recognised *Gastroglottis* as a distinct genus, apparently being unaware of the earlier generic name *Dienia*.

Our studies into this complex group, based on living plants, original descriptions and types (including photographs and microfiche), show that a number of taxa in

the western and south-west Pacific region were overlooked by Szlachletcho. The necessary combinations for these taxa are made here, together with the correction of some nomenclatural and citational errors in Szlachletcho's paper.

***Crepidium* Blume**, Bijdr. 8: 387, f. (1825). Type species: *Crepidium rhedii* Blume (note the spelling).

Synonym: *Pterochilus* Hook. & Arn., Bot. Beech. Voy. 71, t. 17 (1832). Type species: *Pterochilus plantaginea* Hook. & Arn.

Fingardia Szlach., Fragm. Fl. Geobot., Suppl. 3: 134 (1995). Type species: *Microstylis nephroglossa* Schltr., **syn. nov.**

***Crepidium alagense* (Ames) M.A. Clem. et D.L. Jones**, **comb. nov.**

Basionym: *Microstylis alagensis* Ames, Phil. J. Sci., Bot. 2: 318 (1907); *Malaxis alagensis* (Ames) Ames, Orchid. 2: 122 (1908). Type: Philippines; Alag River, 5 Nov. 1906, E.D. Merrill 5801 (Holotype AMES!).

Synonym: *Fingardia alagensis* (Ames) Szlach., Fragm. Fl. Geobot., Suppl. 3: 134 (1995), **syn. nov.**

Distribution: Philippines.

***Crepidium apollinis* (P.F. Hunt) M.A. Clem. et D.L. Jones**, **comb. nov.**

Basionym: *Microstylis heliophila* Schltr., Repert. Spec. Nov. Regni Veg., Beih. 1: 127-28 (1911) & Fig. Atlas t. 50, f. 171 (1928), non Rchb.f. (1881). Type: 'Kaiser-Wilhelms-Land: On more open clay slopes of the Dischore Range, in the vicinity of the Govidjoa Creek, alt. c. 1200 m.', June 1909, R. Schlechter 19732 (Holotype B†).

Synonym: *Malaxis apollinis* P.F. Hunt, Kew Bull. 24: 78 (1970), **nom.**

Crepidium heliophilum (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 127 (1995),

nom. illeg.

Distribution: Papua New Guinea.

Crepidium bataanense (Ames) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis bataanensis* Ames, Phil. J. Sci., Bot. 6: 43 (1911). Type: Philippines; Luzon; Lamas Forest Reserve, Bataan Province, 17 Oct. 1906, F.W. Foxworthy 653 (Holotype AMES!).

Distribution: Philippines; Luzon.

Crepidium brevidentatum (C. Schweinf.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis brevidentata* C. Schweinf., Bishop Mus. Bull. 141: 20, f. 7a (1936). Type: Fiji, Vanua Levu, Mbua Province, on the southern slopes of Mt Seatura, alt. c. 500 m., 27 April 1934, A.C. Smith 1620 (Holotype AMES!; Isotypes BISH, K!, NY, P).

Synonym: *Oberonia brevidentata* C. Schweinf. ex B.E.V. Parham, Trans. & Proc. Fiji osc. 2: 27 (1953).

Distribution: Fiji.

Crepidium carrii (Seidenf. & J.J. Wood) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis carrii* Seidenf. & J.J. Wood, Orch. Pen. Malaysia and Sing. 221, f. 93e (1992). Type: 'Malaya, Gunung Senyum, Pahang', C.E. Carr 228 (Holotype K, illust.!).

Synonym: *Fingardia carrii* (Seidenf. & J.J. Wood) Szlach., Fragm. Fl. Geobot., Suppl. 3: 134 (1995), **syn. nov.**

Distribution: Peninsular Malaya.

Crepidium comans (C. Schweinf.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis comans* C. Schweinf., Bishop Mus. Bull. 141: 21, f. 7b (1936). Type: Fiji, Vanua Levu, Mbua Province, in the lower Wainunu valley, 7 May 1934, A.C. Smith 1739 (Holotype AMES!).

Synonym: *Oberonia comans* C. Schweinf. ex B.E.V. Parham, Trans. & Proc. Fiji osc. 2: 27 (1953).

Distribution: Fiji.

Crepidium cordiglottis (J.J. Smith) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis cordiglottis* J.J. Smith, Bull. Jard. Bot. Buitenzorg (ser. 3) 10: 34-35 (1928). Type: 'Sumatra: Padangsche Bovenlande; Laras Talang, Goenoeng Talang', alt. 1800 m., 28 Oct. 1981, H.A.B. Bünnemeijer 5224 (Holotype BO).

Synonym: *Fingardia cordiglottis* (J.J. Smith) Szlach., Fragm. Fl. Geobot., Suppl. 3: 134 (1995), **syn. nov.**

Note: Szlachetko's incorrectly cites the place of publication of this species as "8: 34 (1926)" the origin of which can be traced back to the abbreviated citation in Index Kewensis.

Distribution: Indonesia; Sumatra.

Crepidium epidendrum (Ames) M.A. Clem. et D.L. Jones, nom. nov.

Basionym: *Malaxis epiphytica* Ames, Sched. Orchid. No. 6., 34 (1923). Syntypes: Philippines; Mindonao, District of Cottabato, alt. 2700 ft., 27 Aug. 1911, C.A. Weberl 223 (Holotype AMES!).

Note: This is a separate species to that described earlier under the name *Microstylis epiphytica* Schltr. (= *Crepidium epiphyticum*). The new specific epithet was chosen to maintain reference to the habit of the species growing on tree trunks.

Distribution: Philippines; Mindonao.

Crepidium euanthum (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis euantha* Schltr., Repert. Spec. Nov. Regni Veg. 16: 43-44 (1919). Type: Kaiser-Wilhelms-Land; inland from



Angriffshafen, A. Kempter s.n. (Holotype B†).

Distribution: Papua New Guinea.

Crepidium floscularium (J.J. Smith) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis floscularia* J.J. Smith, Nova Guinea 14: 362-63, t. 48, f. 21 (1932). Syntypes: Dutch New Guinea; In the northern part, Mamberamo near Prauwenvivouac, 100-180 m., 29 Aug. 1920, H.J. Lam 940; s. loc., 6 Sept. 1920, H.J. Lam 1076; s. loc., 15 Sept. 1920, H.J. Lam 1215 & 1216; West of Doorman-river, 350 m., 23 Sept. 1920, H.J. Lam 1316 (BO).

Malaxis floscularia (J.J. Smith) P.F. Hunt, Kew Bull. 24: 80 (1970), sphalm. "flascularia".

Distribution: Indonesia; Irian Jaya.

Crepidium fulvum (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis fulva* Schltr. in Engl., Bot. Jahrb. 58: 60 (1922); *Malaxis fulva* (Schltr.) P.F. Hunt, Kew Bull. 24: 80 (1970). Type: 'Nordöstl. Neu-Guinea: Im sumpfigen Uferwald am Leonhard-Schultze-Fluß (Sepik-Gebiet)', alt. c. 20-50 m., June 1912, C. Ledermann 7755 (Holotype B†).

Distribution: Papua New Guinea.

Crepidium glabrum (Kraenzl.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Goodyera glabra* Kraenzl., Viert. Nat. Ges. Zurich 74: 107 (1929). Type: New Caledonia, Ermitage, 19 June 1925, A.E. Däniker 2905 (Holotype Z!).

Distribution: New Caledonia.

Crepidium gracillimum M.A. Clem. et D.L. Jones, nom. nov.

Basionym: *Microstylis graciliscapa* Schltr., Repert. Spec. Nov. Regni Veg. 17: 107-8 (1919), non Ames & Schweinf. (1920). Type: Kaiser-Wilhelms-Land: On the border

between German and British New Guinea, A. Kempf s.n. (Holotype B†).

Distribution: Papua New Guinea.

Notes: Szlachetko (1995) made a new combination in *Crepidium* for *Malaxis graciliscapa* Ames & Schweinf. (Orchidaceae 6: 73-75, t. 88I (1920)) based on specimens collected at 'Borneo; Mount Kinabalu; Marei Perei Spur, Clemens 258, November 1915'. This taxon is distinct from *Microstylis graciliscapa* Schltr. and a new name is chosen here.

Crepidium imthurnii (Rolfe) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis imthurnii* Rolfe, Kew Bull. 1921: 53 (1921); *Malaxis imthurnii* (Rolfe) L.O. Williams, Bot. Mus. Leaf. 5: 114 (1938). Type: Fiji; Vetu Levu, Mba Province, at the foot of Mt Tomanivi nera Navai, 28 March 1906, E. im Thurn 208 (Holotype K!).

Synonym: *Microstylis everardii* Rolfe, Kew Bull. 1921: 54 (1921); *Malaxis everardii* (Rolfe) L.O. Williams, Bot. Mus. Leaf. 5: 114 (1938). Type: Fiji; Vetu Levu, Mba Province, at the foot of Mt Tomanivi nera Navai, March 1906, E. im Thurn s.n. (Holotype K!).

Distribution: Fiji.

Crepidium kempfii (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis kempfii* Schltr., Repert. Spec. Nov. Regni Veg. 16: 108 (1919). Type: Type: Kaiser-Wilhelms-Land: On the border between German and British New Guinea, A. Kempf s.n. (Holotype B†).

Distribution: Papua New Guinea.

Crepidium kobi (J.J. Smith) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis kobi* J.J. Smith, Orch. Java 249-50, t. 183 (1905). Type: Java: Tengger bei Tosari oberhalb Pdookojo, alt. c.

2000 m., J.D. Kobus s.n. (Holotype BO).

Synonym: *Fingardia kobi* (J.J. Smith) Szlach., *Fragm. Fl. Geobot.*, Suppl. 3: 134 (1995), **syn. nov.**

Distribution: Indonesia; Java.

Crepidium lamii (J.J. Smith) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis lamii* J.J. Smith, *Nova Guinea* 14: 361-62, t. 48, f. 20 (1932); *Malaxis lamii* (J.J. Smith) P.F. Hunt, *Kew Bull.* 24: 81 (1970). Type: Dutch New Guinea; In the northern part, Mamberamo, 20 m., 4 July 1920, H.J. Lam 545 (Holotype BO, *illustr.!*).

Distribution: Indonesia; Irian Jaya.

Crepidium latilabrum (Schltr.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis latilabris* Schltr., *Repert. Spec. Nov. Regni Veg., Beih.* 1: 140-41 (1911) & *Fig. Atlas* t. 55, f. 192 (1928); *Malaxis latilabris* (Schltr.) P.F. Hunt, *Kew Bull.* 24: 81 (1970). Type: Kaiser-Wilhelms-Land: In humus in the primary forest near Wobbe, alt. c. 200 m., July 1907, R. Schlechter 16273 (Holotype B†).

Synonym: *Fingardia latilabris* (Schltr.) Szlach., *Fragm. Fl. Geobot.*, Suppl. 3: 134 (1995), **syn. nov.**

Distribution: Papua New Guinea.

Crepidium latisegmentum (C. Schweinf.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Malaxis latisegmenta* C. Schweinf., *Bishop Mus. Bull.* 141: 22, f. 7c (1936). Type: Fiji, on the eastern slope of the main ridge of Koro, 29 Jan. 1934, A.C. Smith 976 (Holotype AMES!).

Synonym: *Oberonia latisegmenta* C. Schweinf. ex B.E.V. Parham, *Trans. & Proc. Fiji Soc.* 2: 27 (1953).

Distribution: Fiji.

Crepidium latisepalum (C. Schweinf.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis latisepala* Rolfe, *Kew Bull.* 1921: 53 (1921); *Malaxis latisepala* (Rolfe) C. Schweinf., *Bishop Mus. Bull.* 141: 23 (1936). Type: Fiji; Veti Levu, Mba Province, at the foot of Mt Tomanivi near Navai, 28 March 1906, E. im Thurn 209 (Holotype K!; Isolotype AMES!).

Synonym: *Oberonia latisegmenta* C. Schweinf. ex B.E.V. Parham, *Trans. & Proc. Fiji Soc.* 2: 27 (1953).

Distribution: Fiji.

Crepidium lilacinum (Ames) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Malaxis lilacina* Ames, *Sched. Orchid. No. 6.*, 35 (1923). Syntypes: Philippines; Leyte Jori, alt. c. 600 m., 12 Nov. 1914, C.A. Wenzel 641 (AMES!); s. loc., 15 Nov. 1914, C.A. Wenzel 667; Anitgue Province, Panay, 20 June 1918, R.C. McGregor 6205 (AMES!).

Distribution: Philippines; Leyte and Panay Islands.

Crepidium lokonense (Schltr.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis lokonensis* Schltr., *Repert. Spec. Nov. Regni Veg.* 10: 30-31 (1911). Type: 'Celebes: im Humus der Wälder auf dem Guong Lokon (Minahassa)', alt. c. 1000 m., Nov. 1909, R. Schlechter 20445 (Holotype B†).

Synonym: *Fingardia lokonensis* (Schltr.) Szlach., *Fragm. Fl. Geobot.*, Suppl. 3: 134 (1995), **syn. nov.**

Distribution: Papua New Guinea.

Crepidium longifolium (Rolfe) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis longifolia* Rolfe, *Kew Bull.* 1921: 54 (1921); *Malaxis longifolia*



(Rolfe) L.O. Williams, Bot. Mus. Leaf. 5: 115 (1938). Type: Fiji, Jan. 1878, Horne s.n. (Holotype K!).

Distribution: Fiji.

Crepidium lunatum (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis lunata* Schltr., Repert. Spec. Nov. Regni Veg. 9: 162 (1910); *Malaxis lunata* (Schltr.) Ames, Arnold Arb. 13: 129 (1932), in obs. Type: New Hebrides, Aneityum, 6 July 1896, Morrison s.n. (Holotype B†).

Synonym: *Fingardia lunata* (Schltr.) Szlach., Fragm. Fl. Geobot., Suppl. 3: 134 (1995), **syn. nov.**

Note: Szlachetko (1995) incorrectly cites the place of publication of this species as 'Repert. Spec. Nov. Regni Veg. 4: 162 (1911)'.

Distribution: Vanuatu.

Crepidium macgregorii (Ames) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis macgregorii* Ames, Phil. J. Sci., Bot. 6: 45 (1911). Type: Philippines: Polillo Island, Oct.-Nov. 1909, R.C. McGregor s.n. (Holotype AMES!).

Synonym: *Malaxis longipedunculata* Ames, Phil. J. Sci., Bot. 8: 411 (1914). Type: Philippines: Leyte Island, 29 Nov. 1912, C.A. Wenzel 52 (Holotype AMES!).

Distribution: Philippines; Polillo Island and Leyte Island.

Crepidium mindorense (Ames) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis mindorensis* Rendle, J. Bot. 34: 357 (1896). Type: Philippines: Mindoro Is., Mt. Dulangau, alt. c. 5000 ft., J. Whitehead s.n. (Holotype BM, illust. AMES!).

Distribution: Philippines; Mindoro.

Crepidium mindanaense (Ames) M.A.

Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis mindanaensis* Ames, Phil. J. Sci., Bot. 6: 43 (1911). Type: Philippines; Island of Mindanao, Sept. 1909, A.D.E. Elmer 11855 (Holotype AMES!).

Distribution: Philippines; Mindanao.

Crepidium negrosianum (Ames) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis negrosiana* Ames in Elmer, Leaf. Philipp. Bot. 5: 1561 (1912). Type: Philippines: Island of Negros, Mar. 1908, A.D.E. Elmer 9600 (Holotype AMES!).

Distribution: Philippines; Negros.

Crepidium neoebudicum (Ames) M.A. Clem. et D.L. Jones, nom. nov.

Basionym: *Malaxis neo-ebudica* Ames, J. Arn. Arb. 13: 128 (1932). Type: New Hebrides; Tanna, Lenakel, alt. c. 100 m., 8 Mar. 1921, S.F. Kajewski 137 (Holotype AMES!).

[*Malaxis xanthochila* auct. non (Schltr.) Ames & C. Schweinf.; B. Lewis & P.J. Cribb, Orch. Vanuatu 71, f. 11B (1989)]

Distribution: Vanuatu.

Crepidium nephroglossum (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis nephroglossa* Schltr., Repert. Spec. Nov. Regni Veg., Beih. 1: 140 (1911) 7 fig. Atlas t. 55, f. 191 (1928). Type: Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m., May 1908, R. Schlechter 17742 (Holotype B†).

Synonym: *Fingardia nephroglossa* (Schltr.) Szlach., Fragm. Fl. Geobot., Suppl. 3: 134 (1995), **syn. nov.**

Distribution: Papua New Guinea.

Crepidium ophrydis (Koen.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Epidendrum ophrydis* Koen. in Retz., Obs. Bot. 6: 46 (1791). Type: Thailand,

[Phuket area?], J.G. Koenig s.n. (Lectotype LHS specimen labelled type K!, here designated)

Synonym: *Malaxis ophrydis* (Koen.) Ormerod in Seidenf., Desc. Epid. Kōning 1791, 18 (1995), **syn. nov.**

Notes: The type sheet at Kew, labelled *Epidendrum terrestre*, which is part of the Rottlerianum Herbarium, presented to Kew by the Council of King's College, Feb. 1872, contains two specimens representing two separate species. A lectotype was chosen from these specimens to match the protologue and, fortuitously it also preserves the application of the specific epithet 'latifolia' for the species widely known as *Malaxis latifolia* (see below under *Denia*).

Distribution: Peninsular Malaya.

Crepidium petiolaris (Schltr.) M.A. Clem. et D.L. Jones, **comb. nov.**

Basionym: *Microstylis petiolaris* Schltr. in Engl., Bot. Jahrb. 58: 61 (1922); *Malaxis petiolaris* (Rchb.f.) P.F. Hunt, Kew Bull. 24: 83 (1970). Type: 'Nordöstl. Neu-Guinea: Im sumpfigen Uferwald am Frieda-FluB (Sepik-Gebiet)', alt. c. 20-40 m., June 1912, C. Ledermann 7447 (Holotype B†).

Distribution: Papua New Guinea.

Crepidium plantagineum (Hook. & Arn.) M.A. Clem. et D.L. Jones, **comb. nov.**

Basionym: *Pterochilus plantaginea* Hook. & Arn., Bot. Beech. Voy. 71, t. 17 (1832); *Microstylis plantaginea* (Hook. & Arn.) Steud., Nomencl. bot. (ed. 2) 2: 144 (1840). Type: Society Islands, 1826, Lay? (Holotype K!, illust.!).

Distribution: Tahiti.

Crepidium platyphilum (Rchb.f.) M.A. Clem. et D.L. Jones, **comb. nov.**

Basionym: *Microstylis platyphila* Rchb.f. in Seem., Fl. Vit. 302 (1868). Type:

[Somosomo], Seeman 590 (Holotype W!; Isolotypes AMES!, BM, K!, P).

Synonym: *Microstylis rheedii* auct., non Lindl.; Seem., Bonplandia 9: 260 (1861).

Distribution: Fiji.

Crepidium polyphyllum (Ridley) M.A. Clem. et D.L. Jones, **comb. nov.**

Basionym: *Microstylis polyphylla* Ridley, J. Linn. Soc. 24: 339 (1888). Type: New Caledonia, Vieillard 374 (Holotype BM, lost).

Notes: Despite not being able to locate the type, the description is sufficiently concise, especially in relation to the details of the labellum (side-lobes are short, rounded and obtuse and the mid-lobe is longer, elliptical and obtuse, the auricles broad and obtuse), to differentiate this species from any other from New Caledonia.

Distribution: New Caledonia.

Crepidium purpureiflorum (Ames) M.A. Clem. et D.L. Jones, **comb. nov.**

Basionym: *Malaxis purpureiflorum* Ames & Quisumb, Phil. J. Sci., Bot. 59: 2 (1936). Type: Philippines; near old Nagilian trail, Mt. Province, May 1934, K.B. Day 16 (Holotype AMES!).

Distribution: Philippines.

Crepidium radiculolum (Rolfe) M.A. Clem. et D.L. Jones, **comb. nov.**

Basionym: *Microstylis radicola* Rolfe, Kew Bull. 1921: 54 (1921); *Malaxis radicola* (Rolfe) L.O. Williams, Bot. Mus. Leaflet 5: 115 (1938). Type: 'Fiji: Nandarivatu, on mossy tree roots above ground in shady forest', 1 Feb. 1906, E. im Thurn 64 (Holotype K!).

Distribution: Fiji.

Crepidium reineckeanum (Kraenzl.) M.A. Clem. et D.L. Jones, **comb. nov.**

Basionym: *Microstylis reineckeanum* Kraenzl. in



Engl., Bot. Jahrb. 25: 600 (1898). Syntypes: Samoa; Upolu, Letogo-Flussgebiet, Apr. 1894, F. Reinecke 311 (B†); Tutuila, Matafao-Kamm, Dec. 1894, F. Reinecke 620 (B†).

Distribution: Samoa.

Crepidium rhedii Blume, Bijdr. 8: 387, f. (1825). Type:

Synonym: *Microstylis blumei* Boerlage et J.J. Smith, Icon. Bogor. 2: t. 108, f. B (1903); *Malaxis blumei* (Boerlage et J.J. Smith) Bakh.f., Blumea 12: 68 (1963). Type: cult. ex Buitenzorg (Holotype BO).

Synonym: *Crepidium blumei* (Boerlage et J.J. Smith) Szlach., Fragm. Flor. Geobot., Suppl. 3: 124 (1995), *syn. nov.*

Notes: Szlachetko was apparently unaware that *Microstylis blumei* was described as an alternative name that could be used for *Crepidium rhedii* Blume. The combination *Crepidium blumei* is therefore superfluous since it is based on a later description of the species which is the type of the genus *Crepidium*.

Since the original spelling of the specific epithet was "rhedii" this should be adhered to in preference to "rheedii". Both names are alternative spellings that honour the Dutch colonial administrator and botanist, Hendrik A. van Rheede tot Draakestein (1637-1691), governor of Malabar and head representative of the East Indian Company in India (Stafleu and Cowan 1983).

Distribution: Indonesia; Java.

Crepidium ridleyanum (P.F. Hunt) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis acuminata* Ridley, Trans. Linn. Soc. Bot. 9: 159 (1916), non D. Don (1825). Type: Dutch New Guinea; Camp VIa, on the western bank of the Tsingarong on route to Mt Carstensz, alt. 3100 ft., 1912, A.F.R. Wallatton et al. (Holotype BM!).

Malaxis ridleyana P.F. Hunt, Kew Bull. 24: 84 (1970), *nom.*

Distribution: Indonesia; Irian Jaya.

Crepidium rizalense (Ames) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Malaxis rizalensis* Ames, Phil. J. Sci., Bot. 6: 46 (1911). Type: Philippines; Luzon; Rizal Province, Bosoboso, Aug. 1907, M. Ramos (Holotype AMES!).

Distribution: Philippines; Luzon.

Crepidium schlechteri (Rolfe) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis vitiensis* Schltr., Repert. Spec. Nov. Regni Veg. 10: 249 (1911), *nom. illeg., non* (Rolfe 1909). Type: Viti Levu, upper Rewa River, 1884, Dr. Lucae s.n. (Holotype B†).

Microstylis schlechteri Rolfe, Kew Bull. 1921: 53 (1921), *nom.*

Distribution: Fiji.

Crepidium segaarense (Kraenzl.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis segaarensis* Kraenzl. in Engl., Bot. Jahrb. 7: 435-6 (1886). Type: New Guinea, Mc Cluer Bay, in montane forests, 18 June 1875, Naumann (Holotype B†).

Distribution: Papua New Guinea.

Crepidium tenggerense (J.J. Smith) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis tenggerensis* J.J. Smith, Bull. Dep. Agric. Ind. Neerl. 43: 28-30 (1910). Type: 'Java: Tengger bei Nogko djadjar', M. Buysman s.n. (Holotype BO).

Synonym: *Fingardia tenggerensis* (J.J. Smith) Szlach., Fragm. Fl. Geobot., Suppl. 3: 134 (1995), *syn. nov.*

Distribution: Indonesia.

Crepidium tetralobum (Schltr.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Microstylis tetraloba* Schltr., Repert. Spec. Nov. Regni Veg. 9: 94 (1910). Type: Samoa; Upolu, Betché s.n. (Holotype B†).

Synonym: *Microstylis radiculicola* Rolfe, Kew Bull. 1921: 54 (1921), pro. parte. (fide Kores 1991).

Distribution: Samoa.

Crepidium uncatum (Ames) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis uncata* Ames, Phil. J. Sci., Bot. 6: 46 (1911). Type: Philippines; Laguna, Tayabas Province, Paete Piapi, Mar. 1908, H.M. Curran 9552 (Holotype AMES!).

Distribution: Philippines.

Crepidium vitiense (Rolfe) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis vitiense* Rolfe, J. Linn. Soc. Bot. 39: 173 (1909), non Schltr. (1911). Type: Fiji; "Col i Nandarivatu", Sept. 1907, Gibbs 653 (Holotype BM!; Isolotype K!).

Distribution: Fiji.

Dienia Lindl. in Edwards's, Bot. Reg. 10: sub t. 825 (1824). Type species: ***Dienia congesta*** Lindl.

Synonyms: *Gastroglottis* Blume, Bijdr. 8: 397 (1825). Type species: *Gastroglottis montana* Blume.

Anaphora Gagnep., Bull. Mus. Hist. Nat. (Paris) 2 (ser. 4): 592 (1929). Type species: *Anaphora liparioides* Gagnep.

Dienia benguetense (Ames) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis benguetensis* Ames, Phil. J. Sci., Bot. 6: 43-44 (1911). Type: Philippines: Luzon, Benquet Subprovince, Pauai, c. 2100 m, June 1909, R.C. McGregor s.n. (Holotype AMES!).

Distribution: Philippines; Luzon.

Dienia curranii (Ames) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis curranii* Ames, Phil. J. Sci., Bot. 6: 44 (1911). Type: Philippines: Luzon, Benquet Subprovince, 16 Aug. 1906, H.M. Curran s.n. (Holotype AMES!).

Distribution: Philippines, Luzon.

Dienia latifolia (Smith) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Malaxis latifolia* Smith in Rees, Cyclop. 22: sub *Malaxis* n. 3 (1812). Type: 'Upper Nepal', 1806, Buchanan in herb. J.E. Smith 1396.3 (Holotype LINN!).

(for a list of synonyms see Clements 1989).

Distribution: Southern Asia.

Dienia montana (Smith) M.A. Clem. et D.L. Jones, comb. nov. (**Plate 9B**).

Basionym: *Gastroglottis montana* Blume, Bijdr. 6: t. 2; 9. 397 (1825). Type: Java, C. Blume s.n. (Holotype L!).

Synonyms: *Microstylis bernaysii* F. Muell., Fragm. 11: 21 (1878); *Liparis bernaysii* (F. Muell.) Bailey, Syn. Queensl. fl. 508 (1883). Type: 'In montibus pone Trinity-Bay ad truncos arborem emortuos', 1878, F.M. Bailey s.n. (Holotype MEL!).

Distribution: Indonesia, New Guinea and Australia.

Dienia truncicola (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis truncicola* Schltr., Repert. Spec. Nov. Regni Veg. 10: 30-31 (1911). Type: 'Celebes: An Baumstämmen, c. 1+-2 Fuss über dem Boden, auf dem Guong Masarang (Minahassa)', alt. c. 1200 m., Nov. 1909, R. Schlechter 20478 (Holotype B†).

Synonym: *Crepidium truncicola* (Schltr.) Szlach., Fragm. Fl. Geobot., Suppl. 3: 133 (1995), **syn. nov.**



Note: Schlechter in describing the species compares it to both *Microstylis latifolia* and *M. congesta*.

Distribution: Indonesia; Sulawesi.

Dienia volkensis (Schltr.) M.A. Clem. et D.L. Jones, comb. nov.

Basionym: *Microstylis volkensis* Schltr. in Engl., Bot. Jahr. 56: 458 (1921). Syntypes: 'Palau-Inseln: im dichten Mittelhochwald bei Ngatkip, auf Babelthaob', alt. c. 100 m., Mar. 1914, C. Ledermann 14571 (B⁺); 'Korolinen: In einer feuchten Senkung mit schattigem Gehölzbusch, im Distrikt Mashabal, auf der Insel Yap', alt. 150 m., Dec. 1899, G. Volkens 174 (B⁺).

Distribution: Palau and Caroline Islands.

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The authors wish to express their sincere thanks for the support of the Christenson Research Institute, the Nell and Hermon Slade Trust, the Australian Orchid Foundation; the Directors and Curators of the following herbaria (B, BM, BRI, K, L, LAE, MEL, NSW, P, W and Z) for their assistance and co-operation during visits or the loan of specimens; Dr. Gunnar Seidenfaden and Paul Ormerod for pertinent literature; Marion Garratt, Maggie Nightingale and Karina Fitzgerald for technical assistance, Marion Garratt for preparation of the illustration, and Alex George for the Latin translation.

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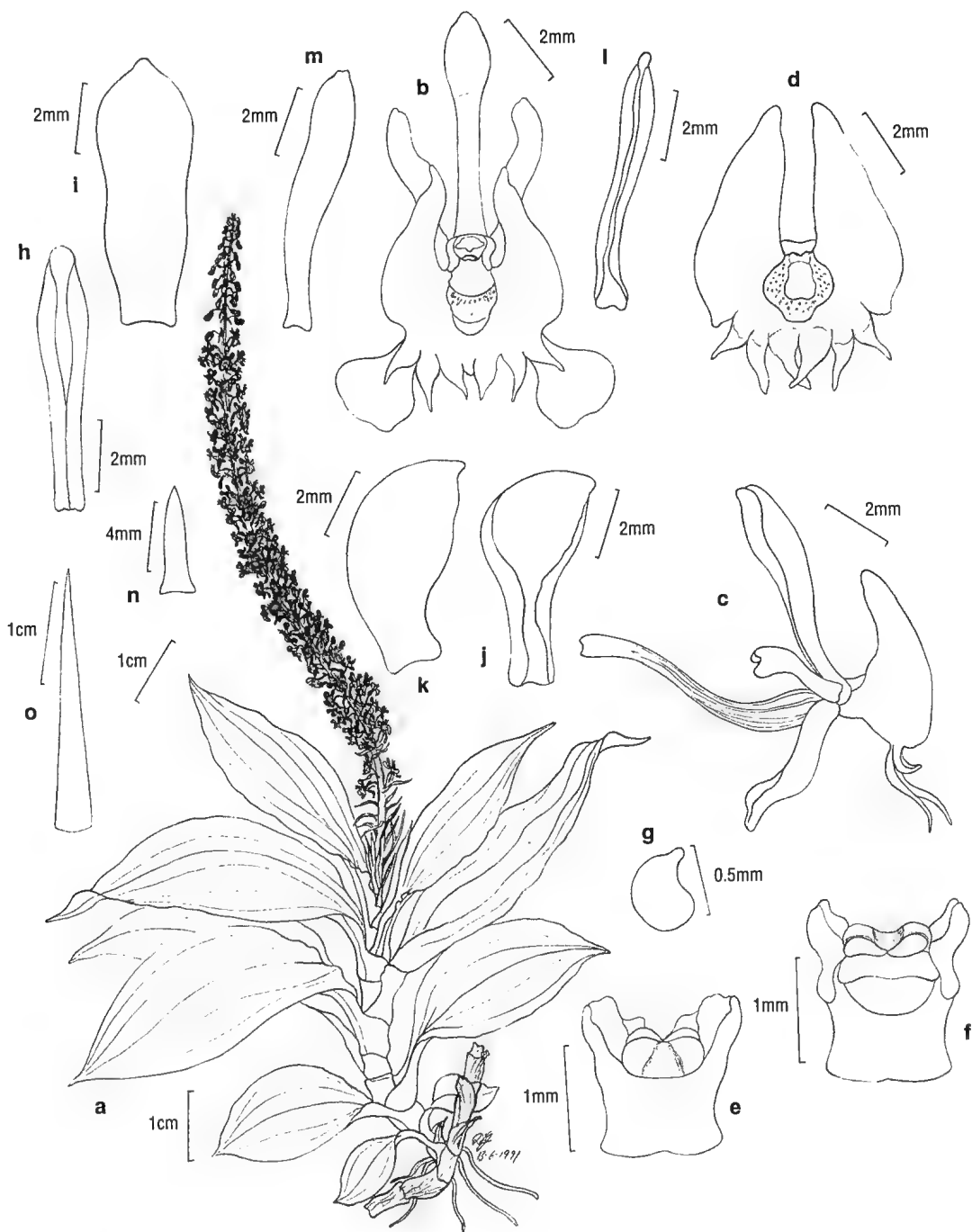


Figure 8. *Crepidium myosotis*, Madang Province; Finnisterre Range, Papua New Guinea, Clements 6354B: a. plant: b. flower from front: c. flower from side: d. labellum flattened: e. column from back: f. column from front: g. pollinaria: h. dorsal sepal: i. dorsal sepal flattened: j. lateral sepal: k. lateral sepal flattened: l. petal: m. petal flattened: n. floral bract: o. sterile bract.



Plate 8A. Flowers of *Crepidium grandifolium*, Clements 6354A.



Plate 8B. Part of inflorescence of *Crepidium myosotis*, Clements 6354B



Plate 9A. Flowers of *Crepidium myosotis*, Clements 7259.



Plate 9B. *Dienia montana*, near Darwin, Northern Territory, Australia.

VANILLA HIRSUTA (ORCHIDACEAE), A NEW SPECIES FROM PAPUA NEW GUINEA

Mark A. Clements & David L. Jones

Centre for Plant Biodiversity Research, Australian National Herbarium, G.P.O. Box 1600, Canberra,
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ABSTRACT:

Vanilla hirsuta (Orchidaceae), from Papua New Guinea, is described as new. A key to the species is provided.

Three species of *Vanilla* Jackson are known from New Guinea, all being described by Schlechter (1911) from collections he made in what was then known as German New Guinea. A new species, collected by one of us (MAC) on the Schlechter-Lauterbach Commemorative Expedition, 1989-90 (Clements and Ziesing 1990) is described here.

MATERIALS AND METHODS

The description of the new species was made from a range of sources including fresh living plants, spirit preserved specimens stored in BANG mix (65 % ethanol, 5 % glycerol 30% water), floral dissection cards and 35 mm colour transparencies of flowers and plants. Specimens were examined from the following herbaria: BM, BRI, CANB, CBG, K and MEL. Herbarium abbreviations follow Holmgren *et al.* (1990). Unless otherwise indicated, all types (or photographs thereof) and collections cited have been seen.

KEY TO PAPUA NEW GUINEA SPECIES OF VANILLA

1. Leaves sessile, tepals narrow, not imbricate at the base, labellum distinctly trilobed, hirsute *V. hirsuta*
- 1a. Leaves petiolate, tepals broad, imbricate at the base, labellum entire or obscurely trilobed, glabrous 2
2. Leaves to 35 cm long, racemes to 30 cm *V. wariensis* Schltr.
- 2a. Leaves less than 30 cm long, racemes to 10 cm long 3
3. Leaves to 11 cm wide, racemes to 10 cm long, labellum margins irregularly erose *V. kempteriana* Schltr.
- 3a. Leaves to 7 cm wide, racemes to 5 cm long, labellum margins undulate *V. kaniensis* Schltr.

TAXONOMY

Vanilla hirsuta M.A. Clem. et D.L. Jones,
spec. nov.

affinis *V. kaniensis* Schltr. sed tepalibus angustis, late effusis, ad basin vix imbricatis; labello distincte trilobato, lobis lateralibus et medio erosis, pagina proximali dense hirsuta, callo tumore medio papillato, striis pluribus ad apicem extensis, et columnae pagina antica hirsuta, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 6 Jul. 1995, M.A. Clements (Holotype CANB; Isotype NCBG). PROV-ENANCE: plant originally collected near Garassa, Morobe Province, Papua New Guinea, 400 m, 11 Apr. 1990, M.A. Clements 6742, P. Ziesing, D. Benzing, E. Dauncey, A. Kairo and O. Simeon.

Plant climbing. **Stems** about 1 cm across with internodes up to 12 cm long, producing a leaf and an adventitious root at each node. **Leaves** sessile, lanceolate, 10–20 cm x 2.5–3.5 cm, thick, fleshy, dark green; apex attenuate, often recurved. **Racemes** axillary, to 5 cm long, green; fleshy, 5 to c. 12-flowered. **Floral bracts** ovate-lanceolate, 10–20 mm x 7–9 mm, acuminate to spreading. **Pedicels** and ovary, 3–4 cm long. **Flowers** c. 7 cm across, opening widely; tepals fleshy, pale green; labellum greenish-white, yellowish towards the centre. **Dorsal sepal** narrowly elliptical-lanceolate, tapered to a narrow linear-oblong base, 6–7 cm x 1.1–1.3 cm, obliquely erect; apex subacute. **Lateral sepals** narrowly elliptical-lanceolate, tapered to a narrow linear-oblong base, 6–7 cm x 1.1–1.3 cm, obliquely deflexed, widely di-

vergent; apex subacute. **Petals** oblong-elliptical, 5–5.6 cm x 8–10 mm, porrect to spreading; apex subobtuse. **Labellum** porrect, 4.5–5 cm x 20–24 mm when flattened, tubular, the dorsal margins enclosing the column, the anterior margins flared; basal 1.5 cm adnate to the anterior surface of the column forming a tube, the internal surface densely hirsute, these hairs extending onto the proximal surface of the lamina; lamina roughly obovate when flattened, distinctly three-lobed, the anterior surface with numerous narrow, sinuate, shallow, longitudinal ridges; lateral lobes c. 23 mm x 7 mm, the anterior margins rounded and shortly erose; mid-lobe oblong-ovate, c. 10 mm x 8 mm, the margins shortly to deeply erose. Callus prominently veined, thin, smooth, with a median papillate swelling, c. 4 mm x 4 mm, consisting of imbricate, cuneate lamellae with an erose dorsal margin, several obscure dark lines extending to the apex. **Column** porrect from the end of the ovary, narrowly linear, semiterete, 3–3.3 cm x c. 3 mm, hirsute medially on anterior surface, incurved slightly and gibbous near the apex; staminode extending prominently above the anther and laterally winged. **Anther** c. obovoid, c. 1.6 mm x 2.2 mm. **Pollinia** ovoid, 0.8 mm across, light yellow, mealy. **Stigma** c. 1.8 mm across. **Rostellum** ovate quadrate, c. 2 mm x 2 mm. **Cap-sule** not seen. **Fig. 9 & Plate 10B.**

FLOWERING PERIOD: June and July in cultivation.

DISTRIBUTION: Papua New Guinea where known with certainty only from the type locality.

HABITAT: Climbing on trees in rainforest in small lateral gullies. Altitude: c. 400 m.



RECOGNITION: *Vanilla hirsuta* is characterised by the following combination of features; lanceolate leaves with an attenuate apex; narrow, widely spreading tepals which hardly overlap at the base; distinctly trilobed labellum with erose margins on the lateral lobes and mid-lobe; proximal surface of the labellum densely hirsute; labellum callus with a median, papillate swelling, several obscure dark lines extending to the apex; and, column with hirsute anterior surface.

AFFINITIES: The three species described by Schlechter (1911) all differ markedly from the new species by having broad segments, imbricate at the base, a broadly obovate-cuneate, obscurely lobed, glabrous labellum and a glabrous column.

CONSERVATION STATUS: Not known.

ETYMOLOGY: Derived from the Latin, *hirsutus*, hairy, in reference to the hairy proximal surface of the labellum and column.

ACKNOWLEDGMENTS

The authors wish to express their sincere thanks for the support the Christenson Research Institute, the Australian Orchid Foundation, Matthew Jebb, Simeon Obedi, Alberto Kairo and the elders of the Korepo village, Morobe Province, for their generous help and assistance during our short visit to the area; Marion Garratt, Maggie Nightingale and Karina Fitzgerald for technical assistance, Robin Hill for preparing the illustration and Alex George for the Latin translation.

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Plate 10A. *Vanilla planifolia*, cultivated at the Royal Botanic Gardens, Kew, England.

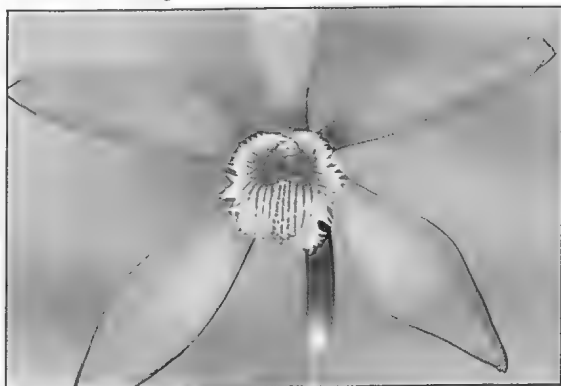


Plate 10B. *Vanilla hirsuta*.

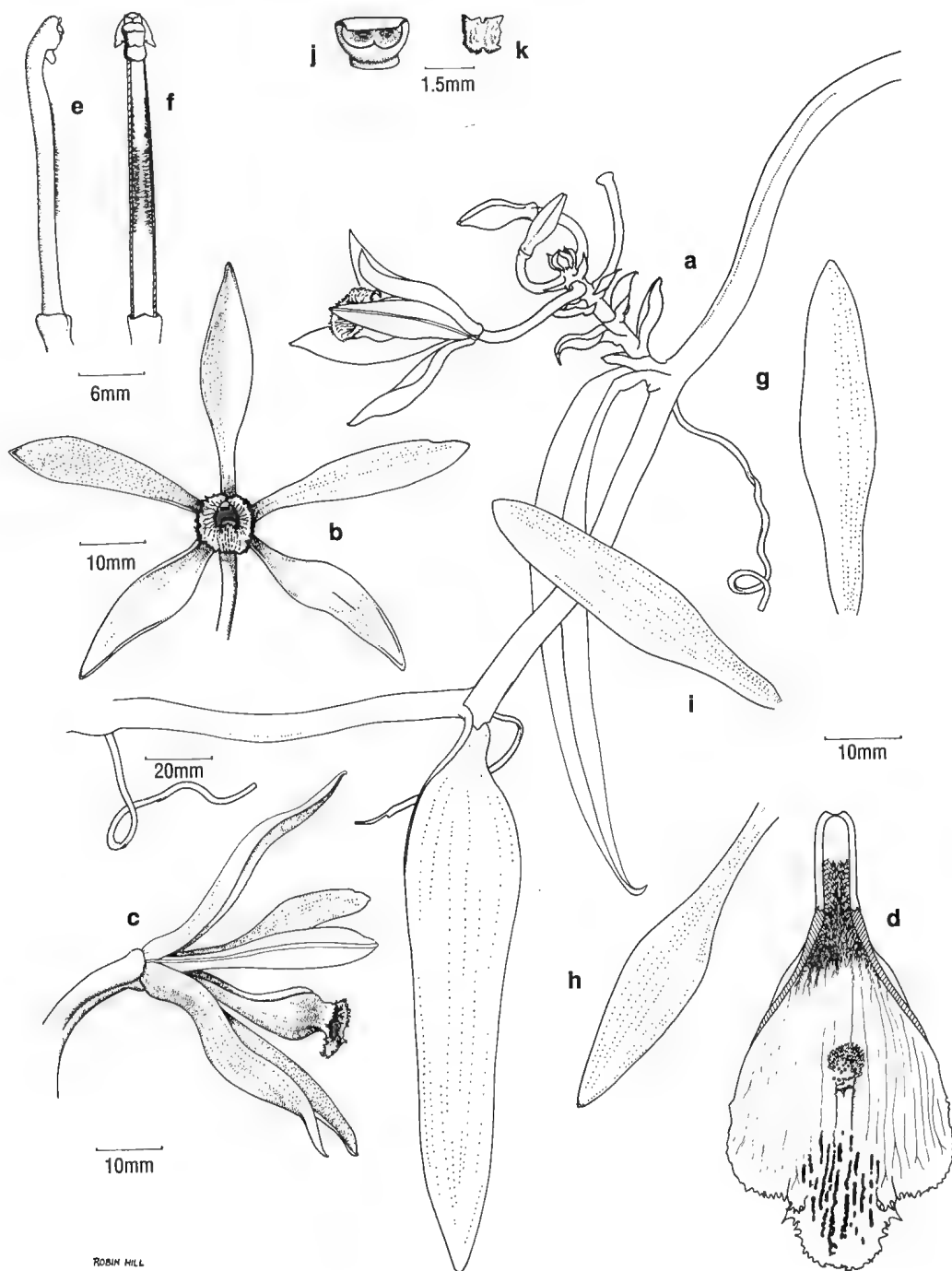


Figure 9. *Vanilla hirsuta*, Morobe Province, near Garassa, Papua New Guinea, Clements 6631: **a.** plant: **b.** flower from front: **c.** flower from side: **d.** labellum flattened: **e.** column from side: **f.** column from front: **g.** dorsal sepal: **h.** lateral sepal: **i.** petal: **j.** anther: **k.** pollinia.

Plate 10B. *Vanilla hirsuta*, Clements 6631



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I must thank the Australian National Botanical Gardens, especially Dr Mark Clements and Dr David Jones for their hard effort and support in supplying the botanic text for this journal. I feel that this is a start of a new era in orchid literature presentation and I am glad that we can take the leading role with our national asset for the benefit of our future generations.

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